No. 1923

DESCRIPTION AND RULES FOR THE MANAGEMENT OF THE

UNITED STATES RIFLE

CALIBER .30, MODEL OF 1903

(THREE PLATES)

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OFFICE OF THE CHIEF OF ORDNANCE,
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By order of the Secretary of War:

WILLIAM CROZIER,
Brigadier General, Chief of Ordnance.

Fig. 1.

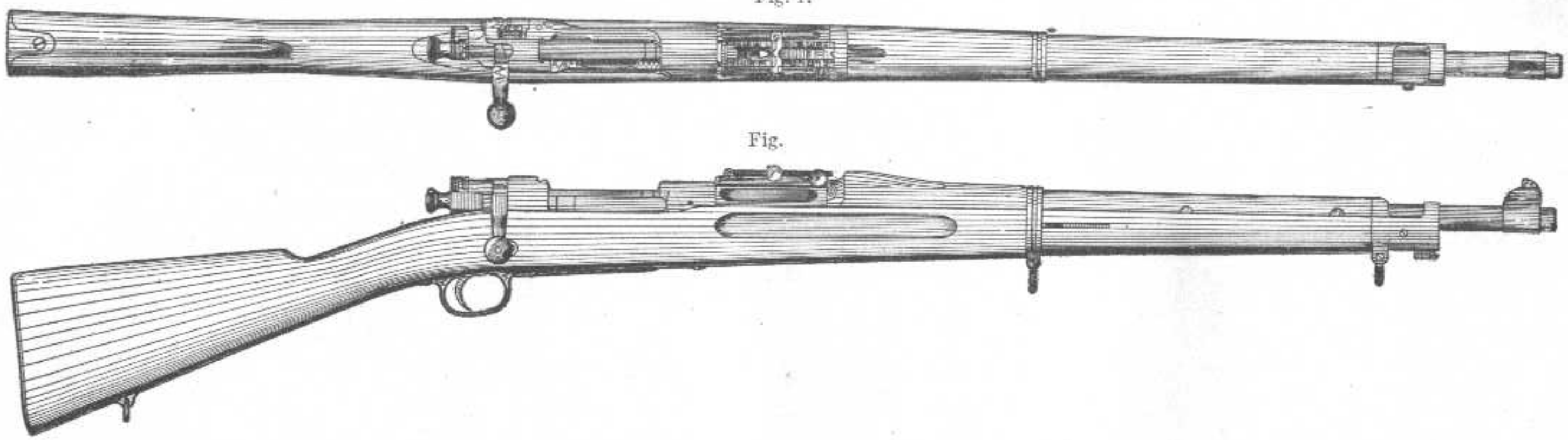


Fig.

United States Rifle, Caliber .30, Model of 1903.

UNITED STATES RIFLE,

CALIBER .30, MODEL OF 1903.

COMPONENT PARTS OF RIFLE.

(Ninety-three in number.)

Barrel:
- Barrel.
- Base Pin.
- Base Spline.
- Fixed Base.
- Fixed Stud.
- Stud Pin.

Bolt:
- Bolt.
- Extractor Collar.

Bolt Stop:
- Bolt Stop Pin.
- Bolt Stop Spring.

Butt Plate:
- Butt Plate.
- Butt Plate Cap.
- Butt Plate Pin.
- Butt Plate Screw, Large.
- Butt Plate Screw, Small.
- Butt Plate Spring.
- Butt Plate Spring Screw.

Butt Swivel:
- Butt Swivel.
- Butt Swivel Pin.
- Butt Swivel Plate.
- Butt Swivel Screws (2).

Cut-off:
- Cut-off.
- Cut-off Plunger.
- Cut-off Screw.
- Cut-off Spindle.
- Cut-off Spring.

Ejector.

Ejector Pin.

Extractor.

Firing Pin:
- Cocking Piece.
- Firing Pin Rod.
- Firing Pin Sleeve.

Floor Plate.

Floor Plate Catch.

Floor Plate Pin.

Floor Plate Spring.

Follower.

Front Sight:
- Front Sight.
- Front Sight Pin.
- Front Sight Screw.
- Movable Stud.

Guard.

Guard Screw Bushing.

Guard Screw, Front.

Guard Screw, Rear.

Hand Guard.

Hand Guard Clips (2).

Lower Band.

Lower Band Screw.

Lower Band Spring.

Lower Band Swivel.

Magazine Spring.

Mainspring.

Rear Sight:
- Base Spring.
- Drift Slide, .05 Peep.
- Drift Slide Pin.
- Joint Pin.
- Leaf.
- Movable Base.
- Slide.
- Slide Binding Screw.
- Slide Cap.
- Slide Cap Pin.
- Slide Cap Screw.
- Windage Screw.
- Windage Screw Collar.
- Windage Screw Knob.

Rear Sight—Continued.
  Windage Screw Pin.
  Windage Screw Spring.
Receiver.
Safety Lock:
  Safety Lock Plunger.
  Safety Lock Spindle.
  Safety Lock Spring.
  Safety Lock Thumb Piece.
Sear.
Sear Pin.
Sear Spring.
Sleeve:
  Sleeve.
Sleeve—Continued.
  Sleeve Lock.
  Sleeve Lock Pin.
  Sleeve Lock Spring.
Stacking Swivel.
Stacking Swivel Screw.
Stock.
Stock Screw.
Stock Screw Nut.
Striker.
Trigger.
Trigger Pin.
Upper Band.
Upper Band Screw.

APPENDAGES.

Drift Slide No. 4.
Drift Slide No. 6.
Front Sight Cover.
Oiler and Thong Case:
  Oil Dropper.
  Oiler Cap Washer.
  Oiler Collar.
  Thong Case Body.
  Thong Case Cap.
Oiler and Thong Case—Con.
  Thong Case Pad.
  Thong Case Partition.
Thong:
  Thong Cord.
  Thong Tip.
  Thong Weight.
Thong Brush.
Spare Part Container.

ACCESSORIES.

Cleaning Rod, Old Model:
  Collar.
  Handle.
  Rivet.
  Rod.
  Sleeve.
Cleaning Rod, Model of 1910:
  Brush Section.
  Handle Section.
  Knob.
  Knob Pin.
  Patch Section.
Cleaning Rod, Model of 1910—Continued.
  Second Section.
  Swivel.
  Swivel Screw.
  Swivel Section.
Cleaning Rod Case.
Screw-Driver:
  Screw-Driver Blade, Large.
  Screw-Driver Blade, Small.
  Screw-Driver Pin.
  Screw-Driver Rivet.

COMPONENT PARTS OF BAYONET, MODEL OF 1905.

(Twelve in number.)

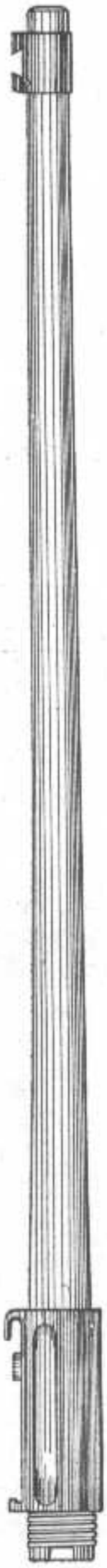
Bayonet Blade.
Bayonet Catch.
Bayonet Grip, Left.
Bayonet Grip, Right.
Bayonet Guard.
Bayonet Nut.
Bayonet Rivets (2).
Bayonet Scabbard Catch.
Bayonet Screw.
Bayonet Spring.
Bayonet Washer.

DESCRIPTION AND NOMENCLATURE OF RIFLE.

The Rifle is shown in Figs. 1 and 2.

The BARREL, with the FIXED STUD and FIXED BASE attached, is shown in Fig. 3. It is 24.006 inches in length, and the rifling consists of four plain grooves, 0.004 inch deep. The grooves are three times the width of the lands. The twist is uniform, one turn in 10 inches.

Fig. 3.



The muzzle is rounded to protect the rifling, and the tenon at the rear is threaded for the purpose of securing the receiver to the barrel.

On the top in rear of the fixed stud is stamped the Ordnance escutcheon, the initials of the place of manufacture, and the month and year. Those manufactured prior to 1906 are stamped "'05" without the month.

The removal from the barrel of the fixed stud, fixed base, or receiver should never be attempted except by competent workmen, in armories fully equipped with the necessary tools and appliances.

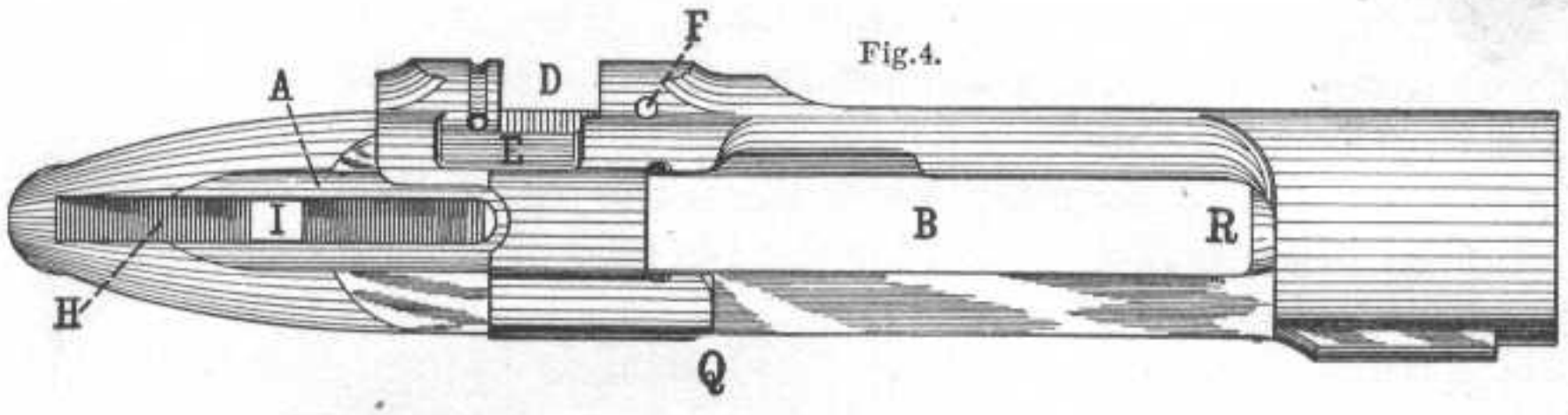
The RECEIVER, Fig. 4, top view, Fig. 5, right side view, and Fig. 6, front end view, has the hole A, called the *well*, which receives the bolt; the *magazine opening* B; the *channel* C, for the top locking lug; the *cut-off seat* D; the *cut-off thumb piece recess* E; *ejector pin hole* F; *clip slots* G; *cocking piece groove* H; *sear nose slot* I; *extracting cam* J; *sear pin hole* K; *gas escape hole* L; *recoil lug* M, in which is the hole for the front guard screw; the *recesses for the bolt locking lugs* N N; the *locking cams* O O; the *locking shoulders* P P; the *safety shoulder* Q; and the *cartridge ramp* R.

On the upper surface of the front end is stamped the serial number of the rifle and the place of manufacture.

The BOLT, Fig. 7, top view, Fig. 8, rear view, and Fig. 9, front view, has the *handle* A; the *locking lugs* B B, which sustain the shock of the discharge, the one on top being slotted to allow the passage of the point of the ejector; the *safety lug* C, which comes into play only in the event of the locking lugs yielding under powder pressure; the *extractor collar groove* D; *extracting cam* E; *sleeve clearance* F; *safety lock spindle notch* G; *sleeve lock notch* H; *firing pin hole* I; *cocking cam* J; *cock notch* K; *extractor tongue groove* L; *gas escape hole*, not shown in cut, between the locking lugs; the *rim* M; and *two small circular notches*, not shown in cut, on the left side of the slotted locking lug; this side of the lug rotates

90° when the bolt is drawn back for loading, and one of the notches engages with the *bolt stop pin* A, Fig. 10, in either single or magazine loading, retaining the bolt in place in the open position.

Fig.4.



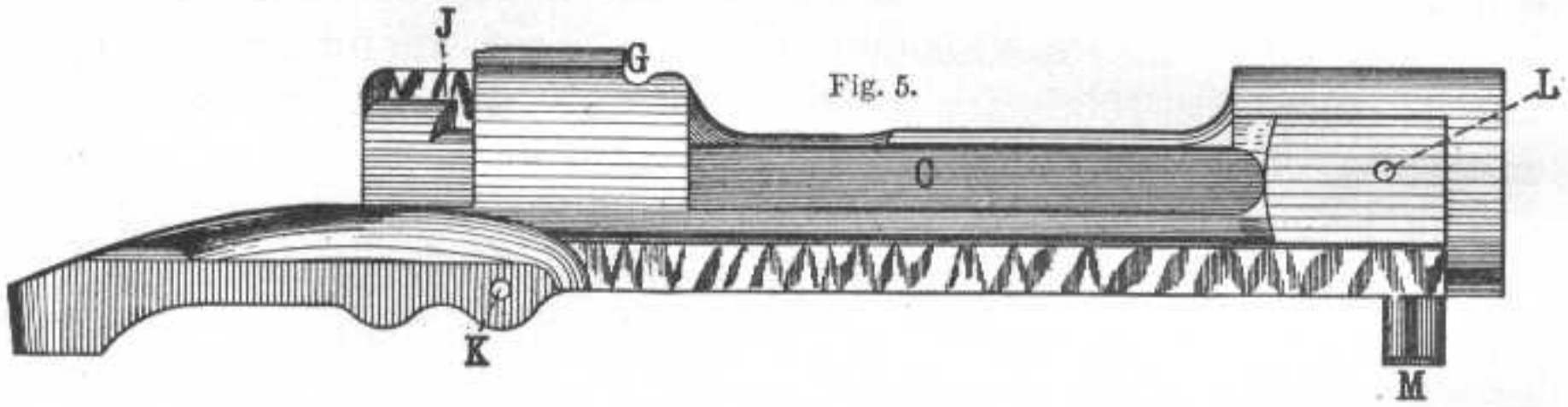


Fig. 5.

The Bolt Stop, Fig. 10, consists of the *pin* A and the flat *spring* B, riveted together in manufacture. The pin projects through its hole

Fig. 6.

Fig. 7.

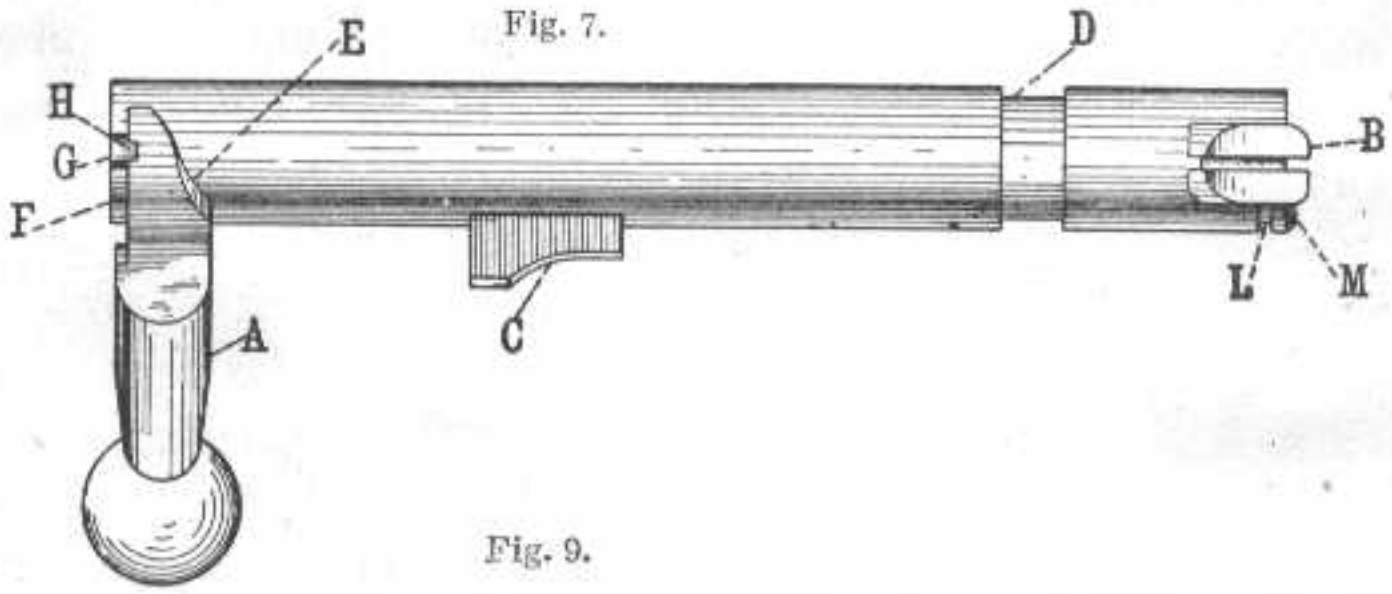


Fig. 8

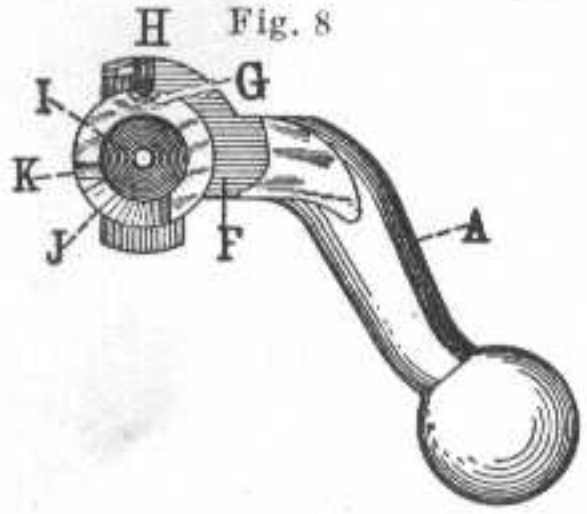


Fig. 9.

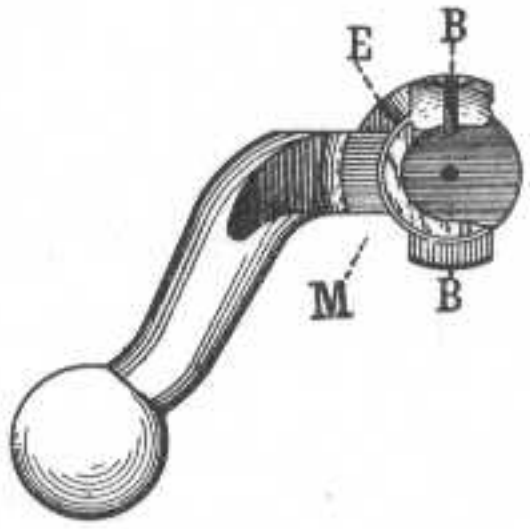
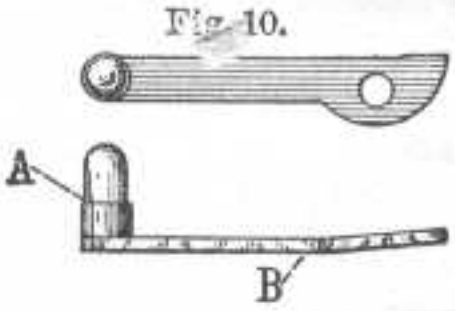


Fig. 10.



in the receiver just in front of the cut-off opening, and is held in place and operated by the spring which fits into a slot in the receiver in the rear of the magazine.

The SLEEVE, Fig. 11, top view, and Fig. 12, left side view, has the *barrel* A, which is threaded for the purpose of securing the sleeve to the bolt; the *safety lock seat* B; the *safety lock plunger groove* C; the *recesses* D, for retaining the safety lock when turned to the right or left; the *recess* E, for retaining safety lock in dismounting bolt mechanism; the *bevel* F, for dismounting the safety lock from the sleeve; the *sleeve lock recess* G; and the *sleeve lock pin hole* H. There are also the *safety lock spindle* and *firing pin holes*, the *cocking piece groove* and the *undercut* for the rear end of the bolt. None of the last four is shown in the cut.

Fig. 11.

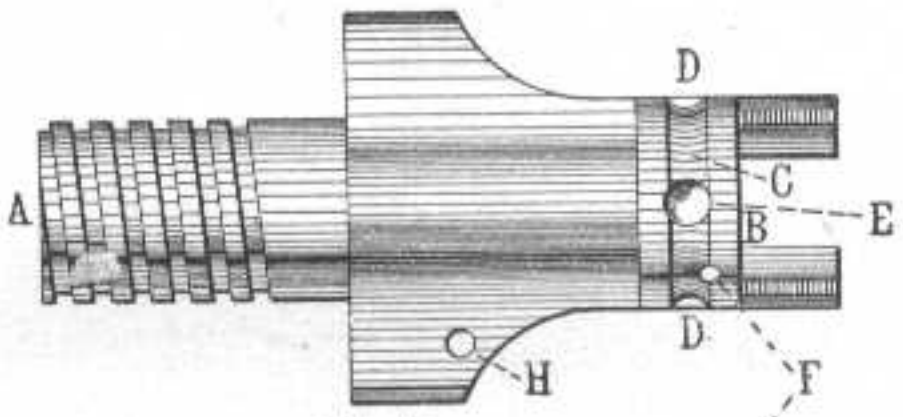
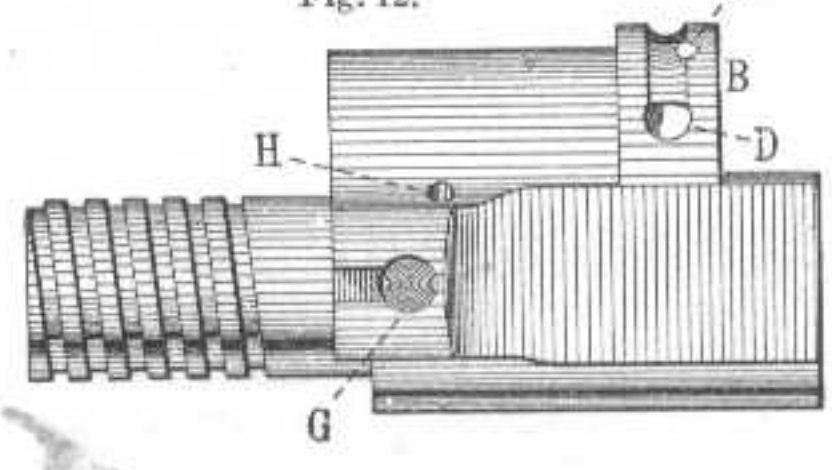


Fig. 12.



The SLEEVE LOCK, Fig. 13, left end view, and Fig. 14, under side view, has the *spindle* A, which is bored out to receive the sleeve lock spring; the *latch* B, and the *sleeve lock pin groove* C. It is designed to prevent accidental turning of the sleeve when the bolt is drawn back.

The SLEEVE LOCK SPRING and PIN are shown in Fig. 15.

The FIRING PIN, Fig. 16, consists of the *firing pin rod* A and the *cocking piece* B, which are made separately, the former being screwed into the latter and riveted in assembling; the length of the rod is so adjusted that when the front end of the cocking piece bears against the interior shoulder of the sleeve the striker point will project the proper distance beyond the face of the bolt. Other parts are the *knob* C, *lug* D, *cocking cam* E,

Fig. 13.

Fig. 14.

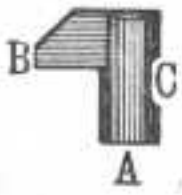
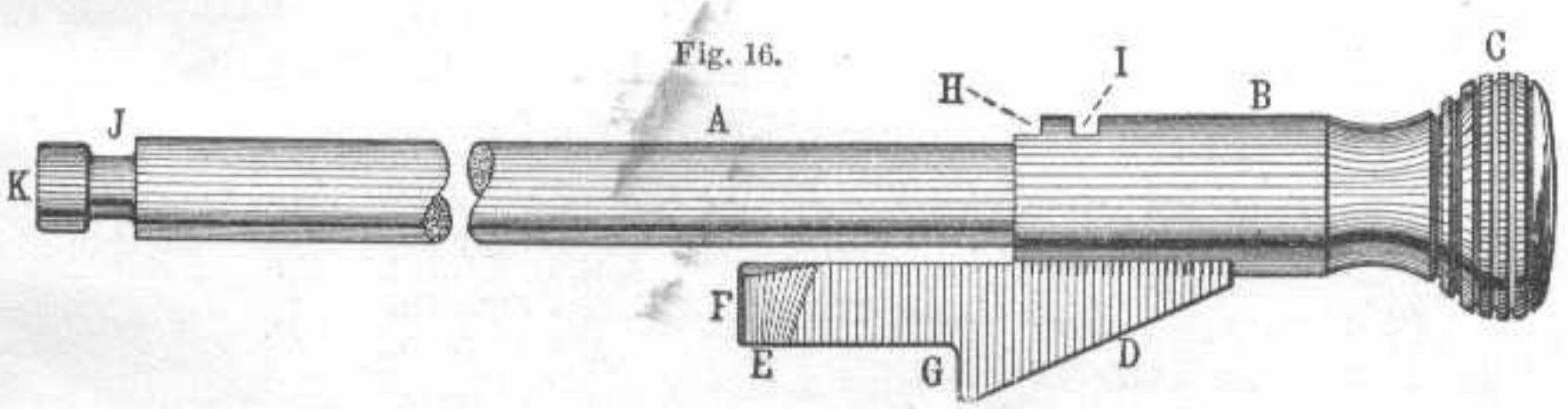


Fig. 15.

Fig. 16.



nose F, *sear notch* G, *locking shoulder* H, *locking groove* I, *neck* J, and *head* K.

The FIRING PIN SLEEVE, Fig. 17, sectional view, fits over the front end of the firing pin and the rear end of the striker, covering the joint hole, and preventing accidental separation of the firing pin and striker; its rear end forms the front bearing for the mainspring.

The STRIKER, Fig. 18, has the *point* A, the *body* B, the *shoulder* C, and the *joint hole* D, by which it is secured to the firing pin. The annular grooves on the striker retain the lubricating oil and prevent the accumulation of rust thereon.

Fig. 17.

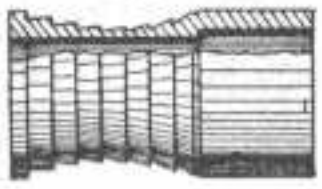
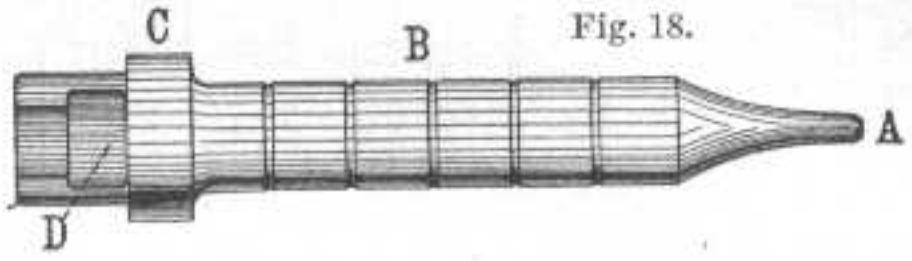


Fig. 18.



The MAINSPRING is shown in Fig. 19.

The EXTRACTOR, Fig. 20, inside view, Fig. 21, top view, and Fig. 22, front end view, has the *hook* A, by which the cartridge case

Fig. 19.

is extracted from the chamber; the *tongue* B, which rides in its groove at the front end of the bolt; the *lug* C C, which is undercut to receive

Fig. 20.

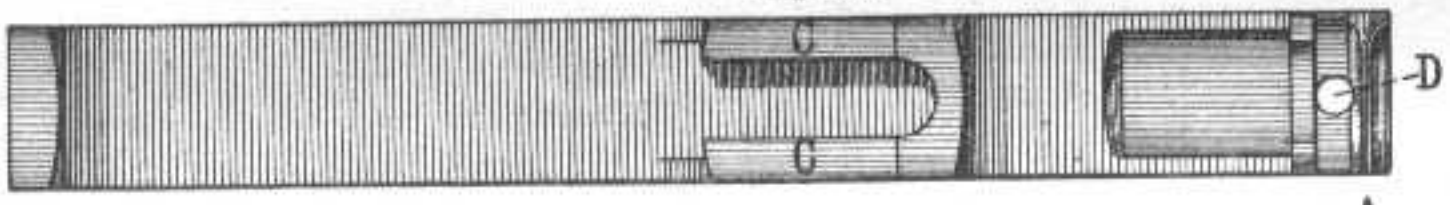
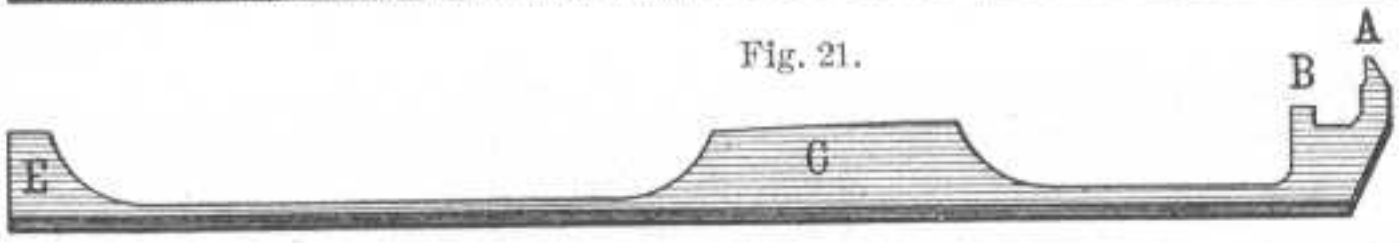


Fig. 22.

Fig. 21.



the ears on the lugs of the extractor collar; the *gas escape hole* D, and the *back rest* E, which is curved to fit the circle of the bolt.

Fig. 23.

Fig. 24.

The EXTRACTOR COLLAR, Fig. 23, end view, and Fig. 24, side view, has the *ears* A A, which fit in the undercuts on the inside of the extractor, by which means and with the assistance of the extractor tongue and groove the extractor is held in place. The collar is bent into position on the bolt in manufacture, and should not be removed unless proper tools are at hand to replace it.

Fig. 25.

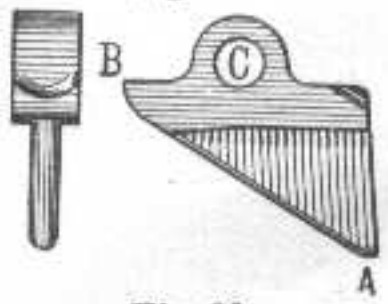


Fig. 26.

The EJECTOR, Fig. 25, has the *point* A, the *heel* B, and the *ejector pin hole* C. It is hinged on the ejector pin in its recess in the left side of the receiver, ejection being accomplished by the slotted lug on the bolt coming in contact with the heel when the bolt is drawn to the rear.

The head of the EJECTOR PIN, Fig. 26, is slotted for the purpose of providing sufficient tension to hold the pin in its place during the process of assembling.

The SAFETY LOCK, Fig. 27, rear and side views, consists of *thumb piece* A, the *spindle* B, *spring* C, and *plunger* D, assembled in manufacture. It has the *cam* E, the *locking groove* F, the *cocking piece groove* G, the *plunger hole* H, and the *bolt clearance* I. The spring and plunger are shown in Figs. 28 and 29, respectively; the latter, projecting into its groove in the sleeve, under the action of the spring, prevents any movement of the safety lock to the rear, and when in the recesses in the groove retains the safety lock turned either to the right or left or in the vertical position for dismounting bolt mechanism. The words "Safe" and "Ready" impressed on opposite sides of the thumb piece indicate that the firing mechanism is locked or ready for firing.

Fig. 27.

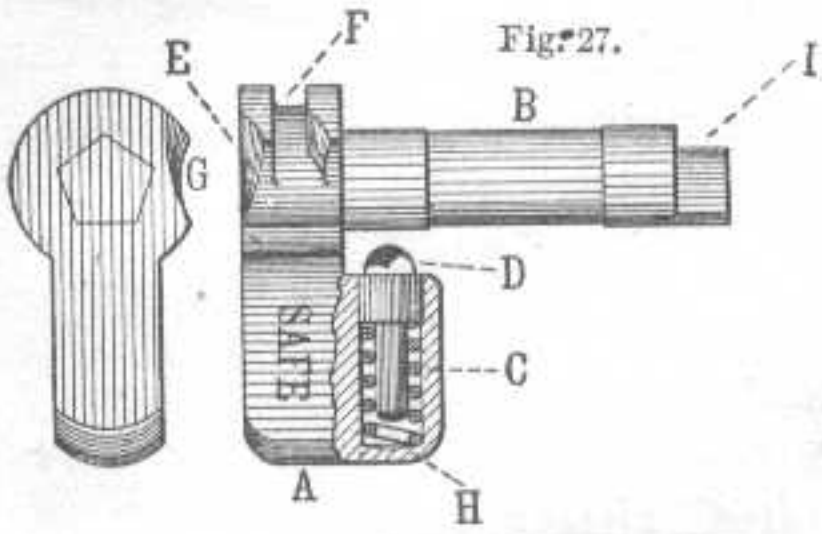


Fig. 28.

Fig. 29.

Fig. 30.

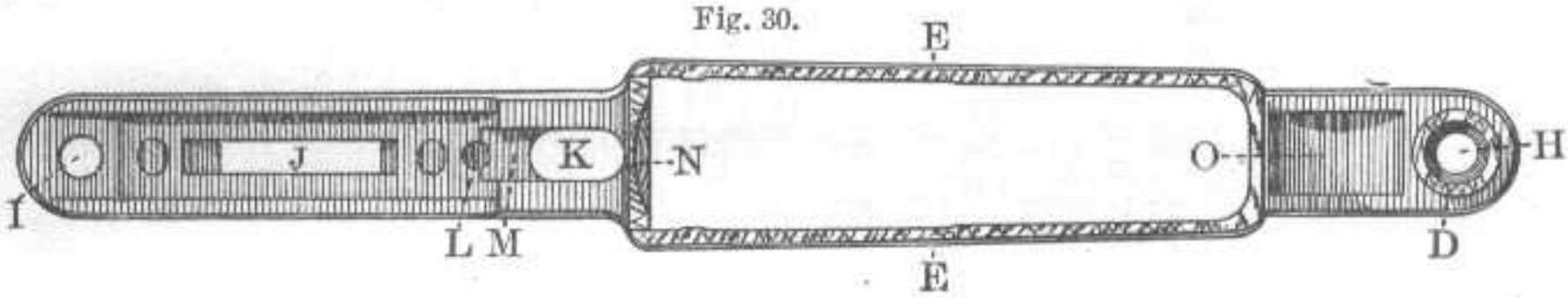
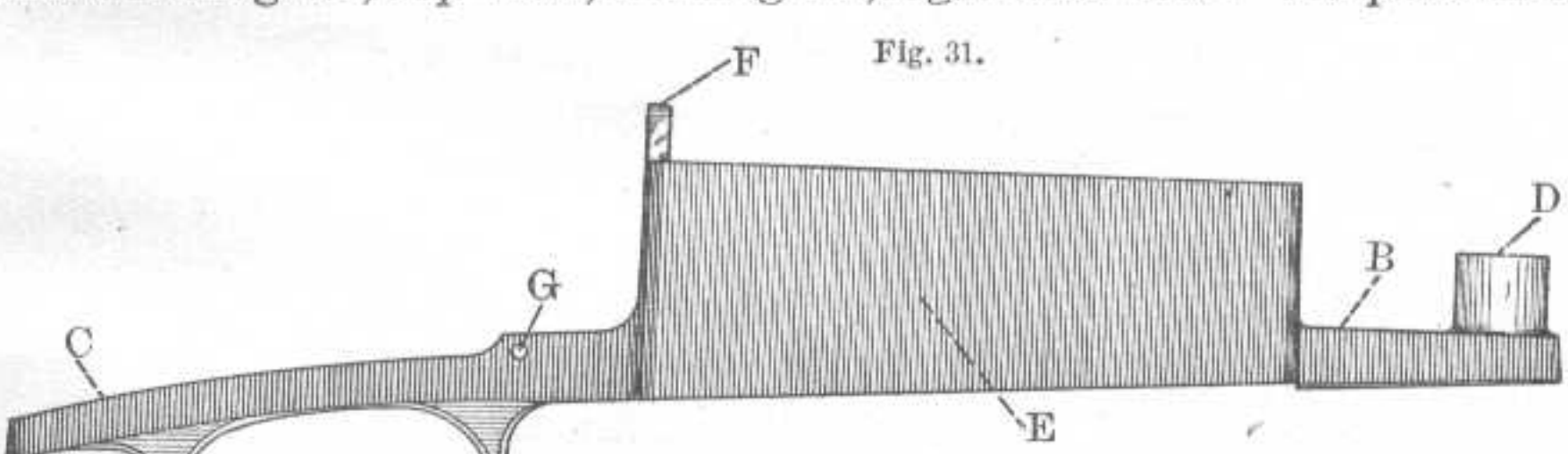


Fig. 31.



guard bow A, *front tang* B, *rear tang* C, *front guard screw stud* D, *magazine walls* E, *rear end of magazine* F, *floor plate pin hole* G, *front guard screw hole* H, *rear guard screw hole* I, *trigger slot* J, *floor plate lug slot* K, *floor plate spring hole* L, *floor plate catch slot* M, *ramp* N, and the *lightening cut* O.

The GUARD SCREW BUSHING, Fig. 32, fits tightly into the stock between the receiver and the rear tang of guard, and serves as a stop

for the screw, preventing its being screwed down tight enough to bend the guard.

The GUARD SCREWS, front and rear, Figs. 33 and 34, secure the guard to the receiver.

The FLOOR PLATE, Fig. 35, inside view, and Fig. 36, sectional view, has the *tenon* A, which fits into a groove at the front end of the magazine and with the assistance of the floor plate catch retains the floor plate securely in its place at the bottom of the magazine; the *lug* B, which is slotted to receive the floor plate catch and has a tenon on its front end which fits into a slot in the magazine; the *cavity* C, through which the floor plate catch is released by means of the end of a bullet; the *magazine spring recess* D, and the *magazine spring seat* E.

Fig. 32.

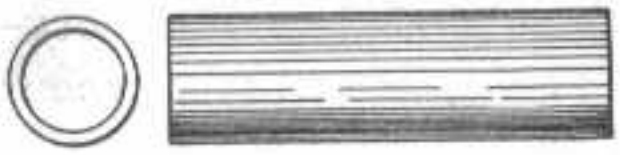


Fig. 33.

Fig. 34.

The FLOOR PLATE CATCH, Fig. 37, hinges on the FLOOR PLATE PIN, Fig. 38, and is operated by the FLOOR PLATE SPRING, Fig. 39. Its function is to retain the floor plate in its seat.

Fig. 35.

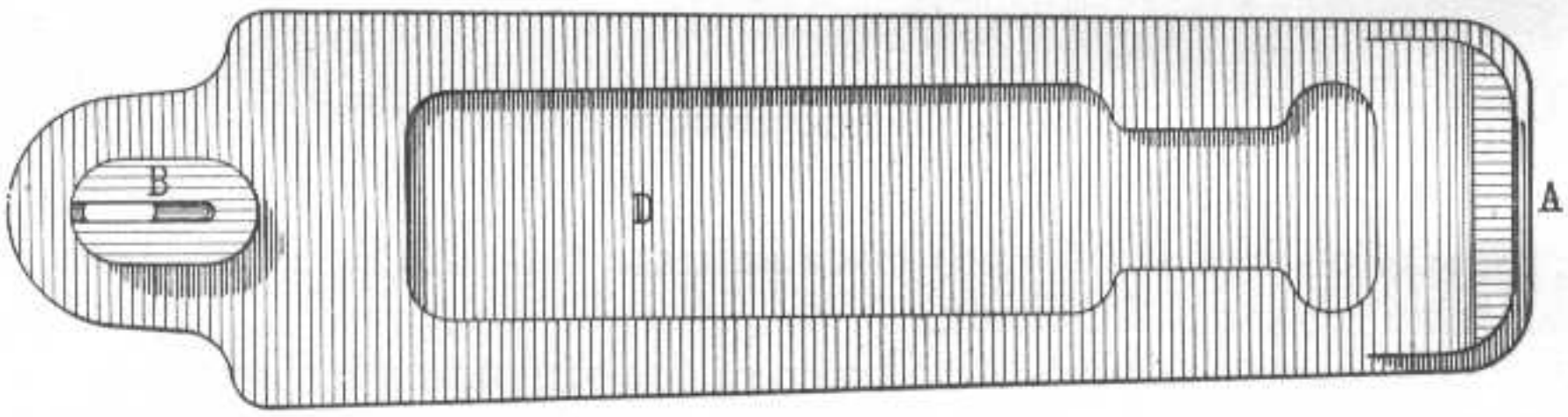
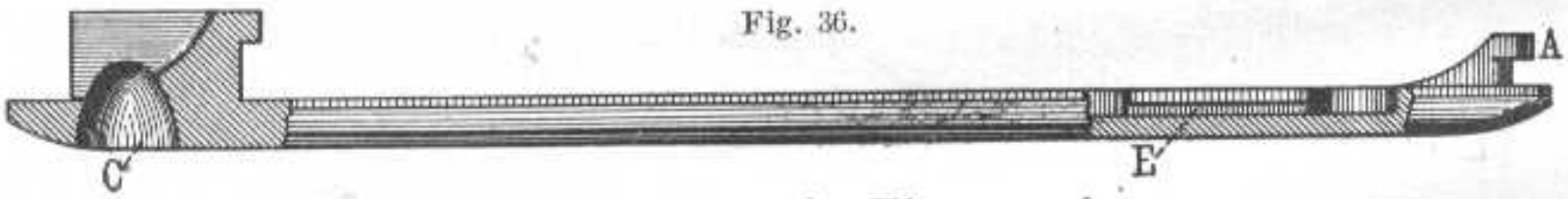


Fig. 36.



The MAGAZINE SPRING is shown in Fig. 40; the smaller end slides into the undercuts on the follower, and the larger end fits in the same way into the undercuts in the floor plate.

Fig. 40.

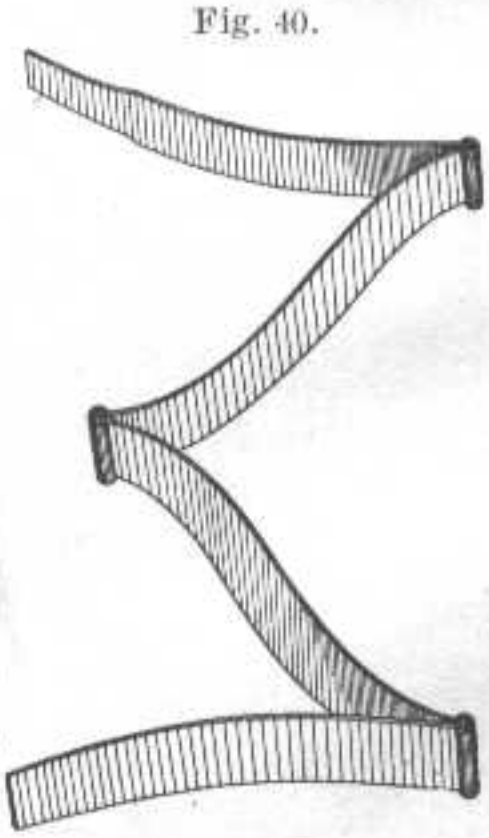


Fig. 37.

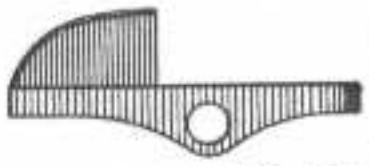


Fig. 38.

Fig. 39.

The FOLLOWER, Fig. 41, top view, and Fig. 42, right side view, has the *rib* A, which serves to locate the cartridges in the magazine and guides the last cartridge into the chamber; the *front stop for the magazine spring* B; the *rear stop for magazine spring* C; and the *lugs* D, in which are the undercuts for the magazine spring.

The CUT-OFF, Fig. 43, side view, Fig. 44, rear view, and Fig. 45, outer edge, has the *thumb piece* A, *body* B, *magazine fire groove* C, *dismounting groove* D, *cut-off spindle hole* E, *cut-off plunger hole* F, *cut-off screw hole* G, and the *serrature* H. The words on opposite sides of the thumb piece indicate to the firer whether the magazine is "on"

Fig. 41.

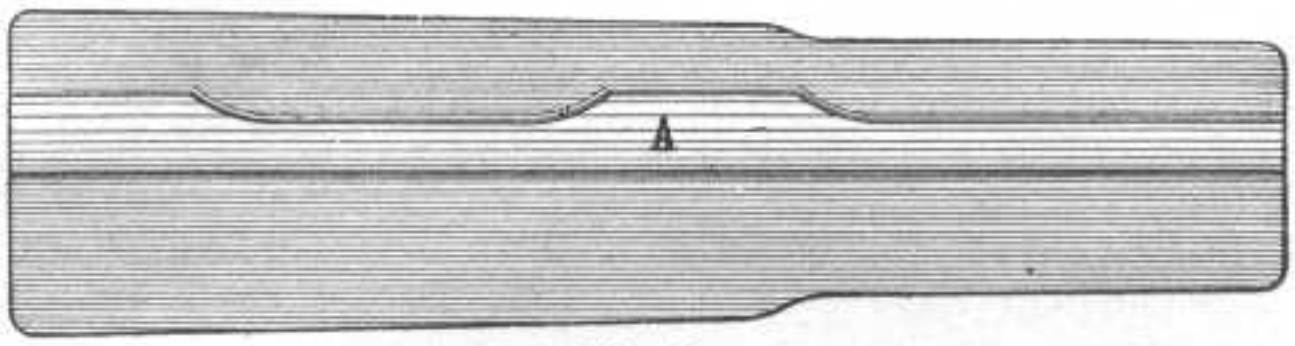
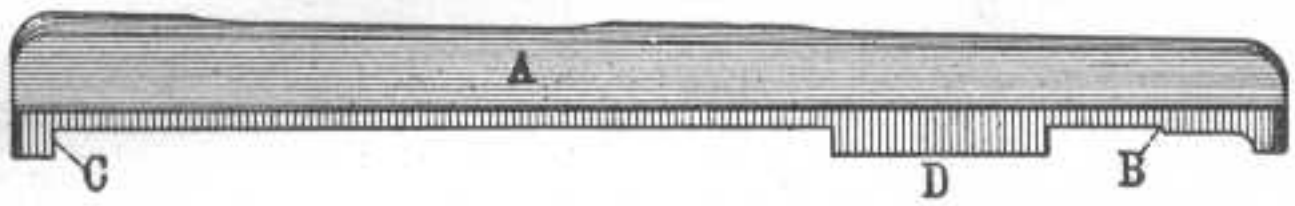


Fig. 42.



or "off." When the cut-off thumb piece is turned down, indicating "off," and the bolt is drawn to the rear, the rear end of the slotted locking lug stops against the projecting front end of the cut-off body. The piece is then ready for single loading. When the cut-off thumb piece is turned up, indicating "on," and the bolt is drawn to the rear, the rear end of the slotted locking lug stops against the shoulder at the rear end of the magazine fire groove. The piece is then ready for loading from the magazine. When the cut-off thumb piece is in the intermediate position, the *dismounting groove* D permits the bolt to be drawn entirely out of the receiver.

Fig. 43.

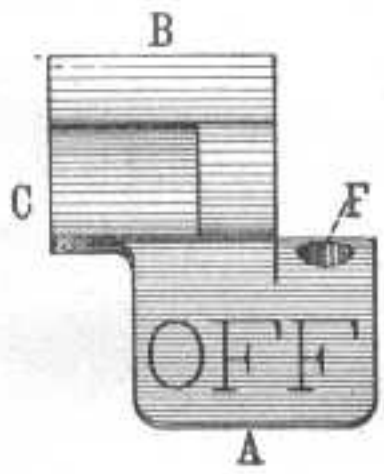
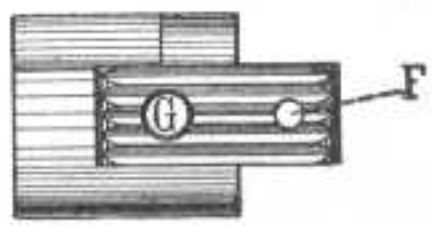


Fig. 44.

Fig. 45.



The CUT-OFF SPINDLE, Fig. 46, has the *cut-off screw groove* A and the *dismounting groove* B.

Fig. 46.

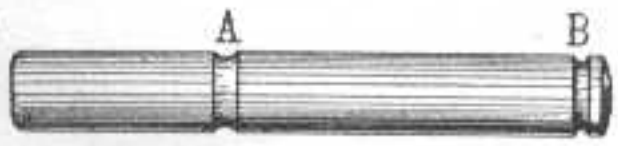


Fig. 47.

Fig. 48.

Fig. 49.

The CUT-OFF SCREW, Fig. 47, goes through the cut-off from the outer edge of the thumb piece, its end fitting into the groove in the cut-off spindle.

The CUT-OFF SPRING, Fig. 48, and the PLUNGER, Fig. 49, retain the cut-off in its seat in the receiver with the thumb piece turned up for loading from the magazine, down for single loading, or in the inter-

mediate position for permitting the removal of the bolt. The spindle head works in a groove in left side of receiver, having three small notches corresponding to the above positions of the cut-off.

The SEAR, Fig. 50, top view, and Fig. 51, right side view, has the *sear nose* A, *pin hole* B, *trigger slot* C, *trigger pin hole* D, and *sear spring seat* E, which is occupied by the SEAR SPRING, Fig. 52, its upper end bearing against the receiver.

Fig. 50.

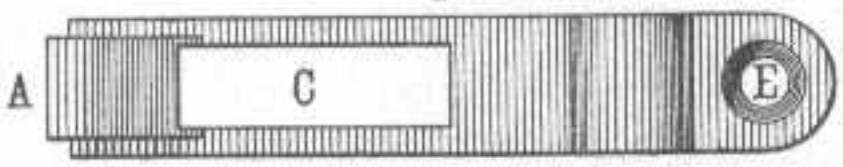


Fig. 52.

Fig. 51.

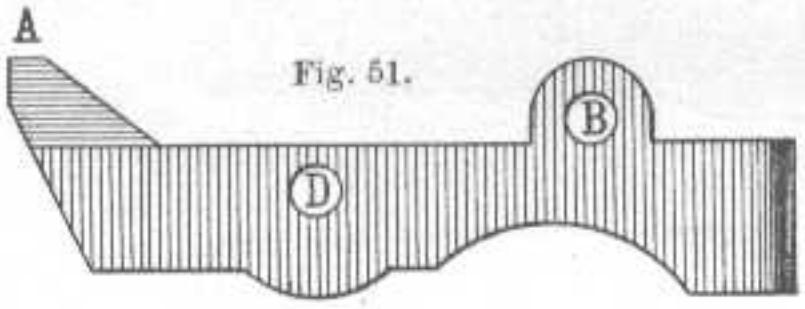


Fig. 53.

The SEAR PIN, Fig. 53, hinges the sear in the receiver.

The TRIGGER, Fig. 54, right side view, and Fig. 55, front view, is hinged in its slot in the sear by the TRIGGER PIN, Fig. 56. It has the *finger piece* A, which is knurled to prevent slipping of finger; the *bearing* B; *trigger pin hole* C; *heel* D; and the *stop* E.

The FRONT SIGHT, Fig. 57, is secured in its slot in the movable stud by the FRONT SIGHT PIN, Fig. 58; the pin is tapering, and its small end is driven in from the right and *the ends* upset to prevent accidental removal.

Fig. 54.

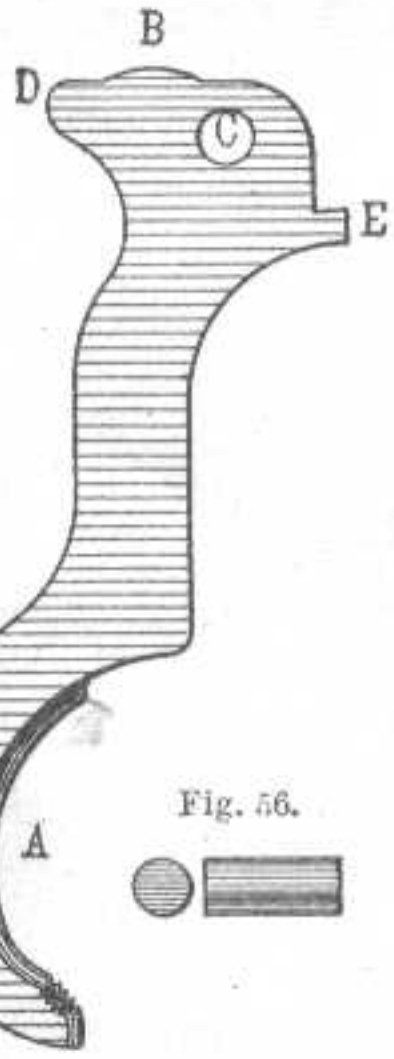


Fig. 55.

Fig. 56.

Fig 57.

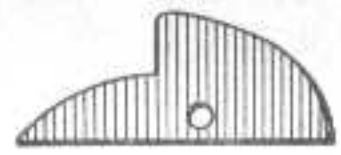


Fig. 58.

The FIXED STUD and MOVABLE STUD, with FRONT SIGHT in place, are shown assembled, Fig. 59, right side view,

Fig. 59.

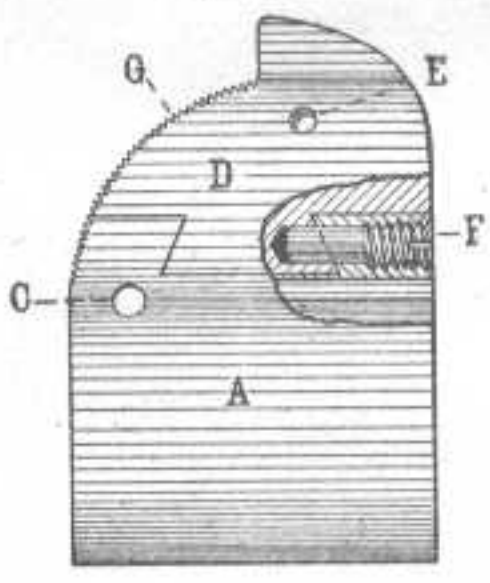
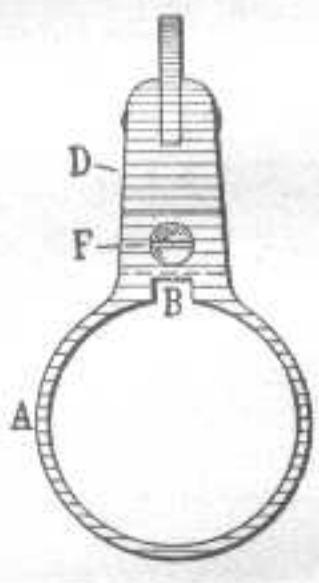


Fig. 60.



and Fig. 60, front view. The FIXED STUD A has a *slot* B, which, bearing on a lug on the upper side of the barrel, prevents lateral displacement of the stud; and *hole* C, for the STUD PIN, which prevents longitudinal displacement of the stud. The MOVABLE STUD D has the *front sight pin hole* E. It is held by the undercut slot in the fixed stud

and secured from lateral displacement by the FRONT SIGHT SCREW F. The recess for this screw is not drilled in the movable stud until the correct position of the movable stud has been determined. The *rear face* G, of both the fixed stud and movable stud is serrated to prevent any reflection of light from this surface interfering with the aiming.

Fig. 61.

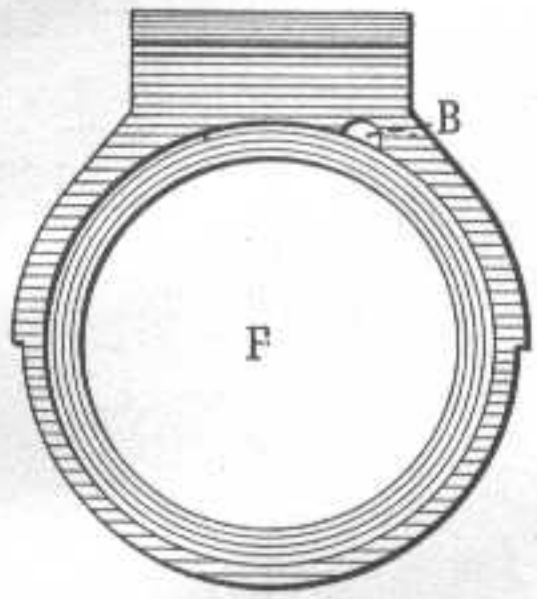
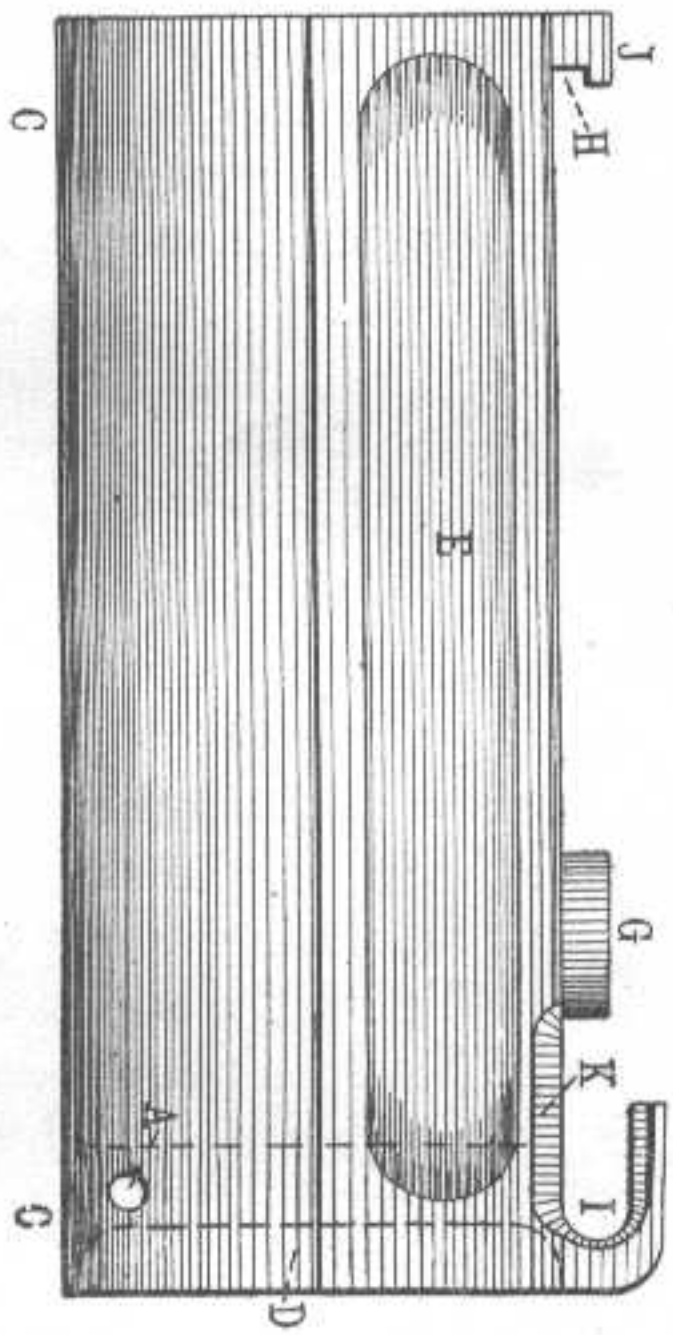


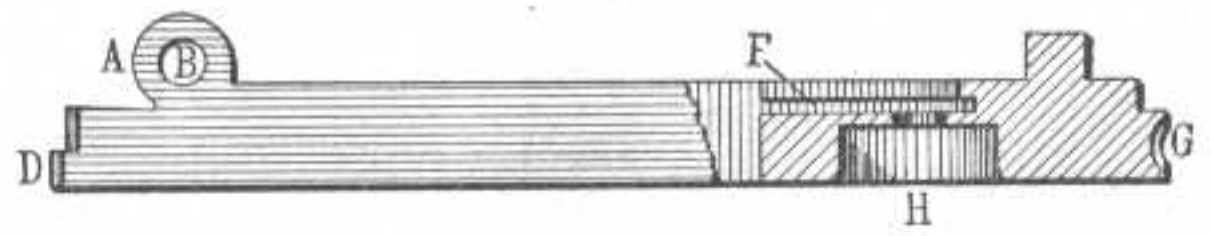
Fig. 62.



The FIXED BASE, Fig. 61, rear end view, and Fig. 62, right side view, has the *holes* A and B, for the base pin and base spline, respectively, by which it is firmly secured to the barrel and lateral and longitudinal movement prevented; the *undercut* D, for the tenon of the hand guard; the *lightening cuts* E; the *barrel hole* F; the *pivot lug* G, for the movable base; the *undercut* H, for the lip on the rear end of the movable base; the *undercut* I, for the windage screw and the lip on the front end of the movable base; the *lug* J, on the top of which are two zero marks for the wind gauge graduations, and the *chamfer* K, the seat for the windage screw collar. This chamfer is carried to the rear to permit of the assembling of the fixed base and the windage screw. On the left side of the front lug the chamfer corresponding to K is merely a conical recess for the head of the windage screw.

Fig. 63.

Fig. 64.



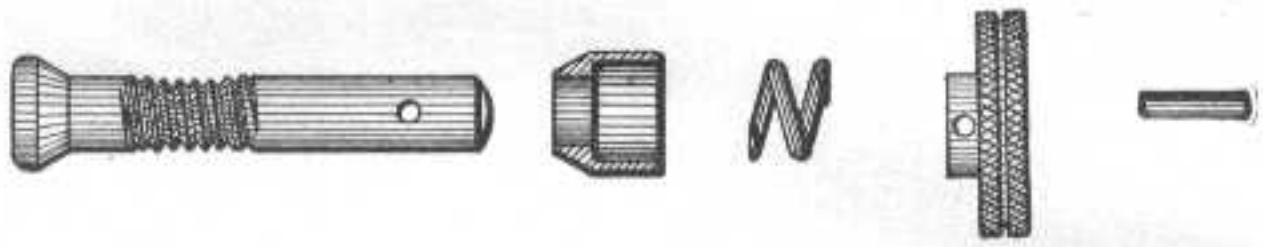
The BASE SPLINE locates and prevents the base from turning on the barrel.

The BASE PIN, similar to the base spline, prevents longitudinal movement of the base on the barrel.

The MOVABLE BASE, Fig. 63, top view, and Fig. 64, right side view, has the *ears* A, in which are the *holes* B, for the joint pin, which serves

as a hinge for the leaf; the *wind gauge graduations* C, each point of which corresponds to a lateral deviation of 4 inches for each 100 yards; the *lip* D, which fits in the undercut in the rear end of the fixed base; the *spring opening* E; the *spring seat* F, which is undercut to admit the lip on the front end of the base spring; the *lip* G, in which is a worm gear for the engagement of the windage screw; the *pivot hole* H, for the pivot lug on the fixed base, and the *shoulders* I, on which the front end of the leaf rests when down. The *hole* K is made for convenience in manufacture.

Fig. 65. Fig. 66. Fig. 67. Fig. 68. Fig. 69.



The WINDAGE SCREW consists of the *screw*, *collar*, *spring*, *knob*, and *pin*, Figs. 65, 66, 67, 68, and 69, respectively. The taper head of the screw fits into the conical recess in the left side, and the taper of the collar into the chamfer in the right side of the fixed base; the thread on the screw engages the worm gear in the lip of the movable base. Under the action of the spring, lost motion due to wear is prevented between the windage screw and the movable base and between the windage screw and the front lug of the fixed base.

The BASE SPRING, Fig. 70, top view, and Fig. 71, side view, has the *lip* A, which fits in the undercut in its seat in the movable base; the *free end* B, and the *hole* C, by which, with the aid of a drift made for the purpose, the spring is assembled or dismounted by driving it into or out of its seat in the movable base.

Fig. 70.

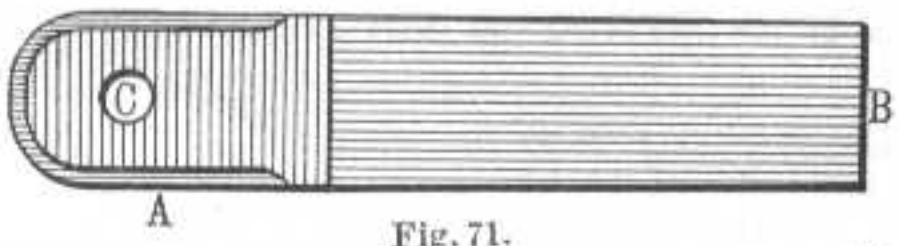


Fig. 71.

Fig. 72.

The JOINT PIN, on which the leaf hinges, is shown in Fig. 72. It is cylindrical, with rounded ends, and fits tightly in the ears of the base.

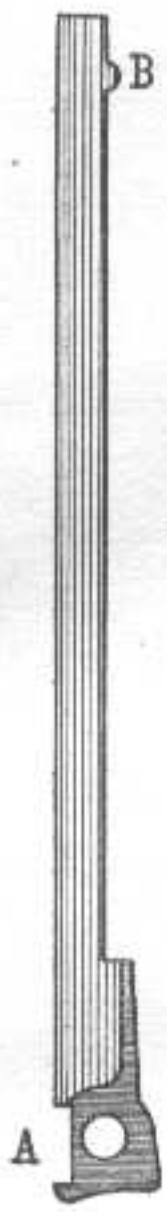
The LEAF, Fig. 73, top view (when down), and Fig. 74, right side view, has the *joint* A, in which is the *joint pin hole;* the *rib* B; the *undercut* C, for the drift slide, and the *sighting notch* D. The free end of the base spring bears against the lower end of the leaf and maintains it in either its lowered or raised position. The leaf is graduated from 100 to 2,850 yards. The lines extending across one or both branches of the leaf are 100-yard divisions, the longer of the short lines are 50-yard and the shorter lines 25-yard divisions.

The DRIFT SLIDE, .05 PEEP, Fig. 75, top view (leaf down), has the *peephole* A, 0.05 inch in diameter; the *field view* B; the *drift slide pin* C,

riveted to the slide in manufacture, and the *notches* D. The lines on either side of the peephole and lower notch enable the drift slide to be accurately set at any desired graduation on the leaf.

Fig. 73.

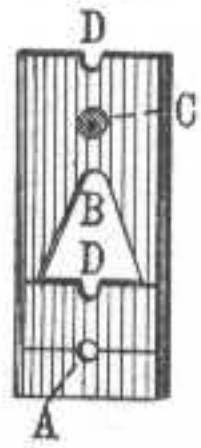
Fig. 74.



As the slide is moved up or down on the leaf the drift slide moves with it and at the same time has a lateral movement in the undercut between the branches of the leaf, thus automatically correcting for drift. This movement corrects for all drift up to 600 yards, but for only part of the drift beyond that range.

With the leaf up, ranges from 100 to 2,350 yards can be obtained through the peephole; from 100 to 2,450 yards through the lower notch at the bottom of field view; and from 1,400 to 2,750 yards through the upper notch in the upper edge of the drift slide.

Fig. 75.



The 2,850-yard range is obtained through the sighting notch in the upper end of the leaf.

With the leaf down and using the battle sight notch in slide cap the sights are set for 547 yards or battle line firing for the down position of the slide.

The SLIDE, Fig. 76, top view (leaf down), Fig. 77, front view (leaf down), and Fig. 78, right end view, has the *leaf slot* A; the *clearance*

Fig. 76.

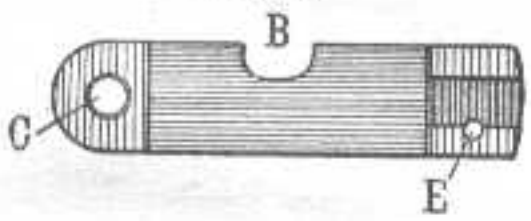


Fig. 77.

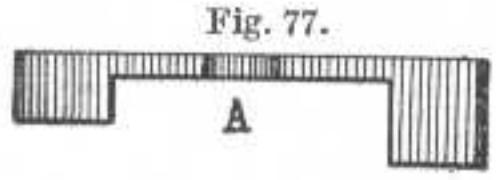


Fig. 78.

B, for the open notch in the drift slide; the *slide cap screw hole* C; *slide binding screw hole* D; *slide cap pin hole* E, and the *dovetailed groove* F, for the slide cap.

Fig. 79.

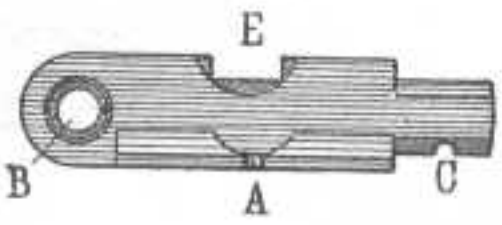


Fig. 80.

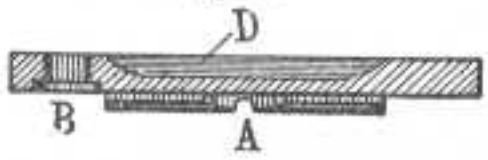


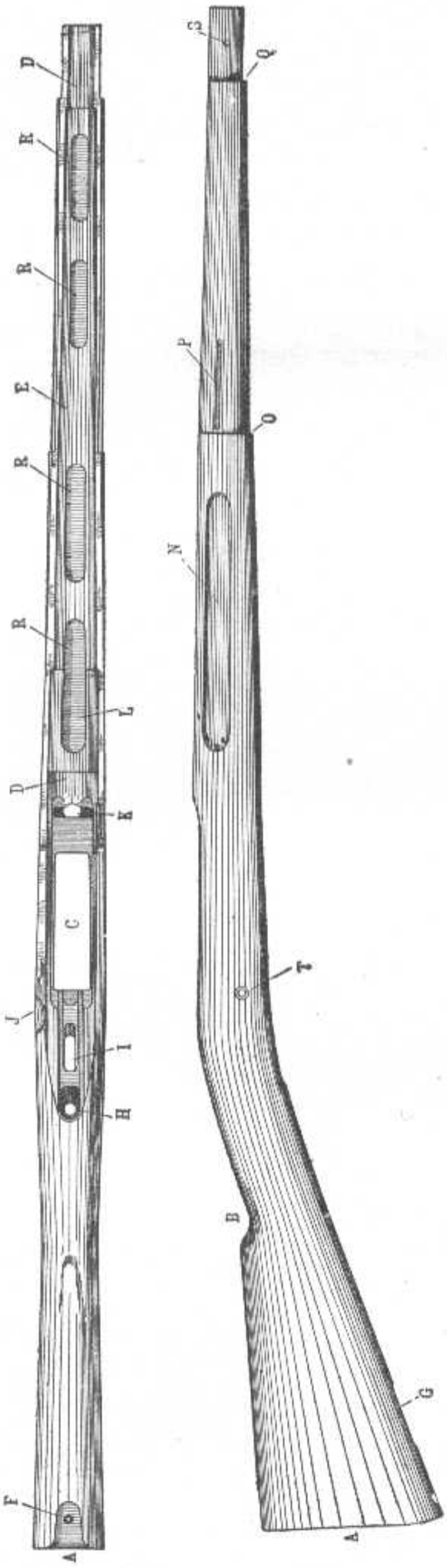
Fig. 81.

Fig. 82.

Fig. 83.

The SLIDE CAP, Fig. 79, top view (leaf down), and Fig. 80, cross section, has the *battle sight notch* A, *slide cap screw hole* B, *slide cap pin hole* C, the *groove* D, for the drift slide pin; and the *clearance* E, for the upper notch in the drift slide.

Fig. 84. Fig 85.



The cap is attached to the slide by entering the dovetailed groove at the right and by the slide cap screw at the left, thus securing the slide to the leaf.

The SLIDE CAP SCREW is shown in Fig. 81.

The SLIDE CAP PIN, Fig. 82, is inserted in the *pin hole* E, in the slide, Fig. 76, and fitting into a groove in the SLIDE BINDING SCREW, Fig. 83, prevents the accidental removal of the latter.

The STOCK is shown in Fig. 84, top view, and Fig. 85, right side view. The parts are the *butt* A; *small* B; *magazine well* C; *barrel bed* D; *air chamber* E, which reduces the charring effect of a heated barrel on the stock; *hole for butt plate screw, small,* and *seat for the butt plate tang* F; *butt swivel plate seat* G; *mortise for receiver tang lug* and *hole for rear guard screw* H; *mortise for sear* and *slot for trigger* I; *cut-off thumb piece recess* J; *mortise for recoil lug on receiver* K; *bed for fixed base* L; *grasping grooves* N; *shoulder for lower band* O; *bed for lower band spring* P; *shoulder for upper band* Q; *channels for decreasing weight* R; *upper band screw hole* S; and the *stock screw hole* T. The large hole in the butt is for decreasing weight, and the smaller one is a pocket for the combination oiler and thong case or spare part container.

The initials of the inspector and the year of fabrication are stamped on the left side in the rear of the cut-off thumb piece recess.

The HAND GUARD, Fig. 86, right side, and Fig. 87, bottom or inner surface, has the *swell* A, for the protection of the rear sight; the *shoulder* B, *for the lower band;* the *shoulder* C, *for the upper band;* the *rear tenon* D, which enters the under-

cut in the fixed base; the *front tenon* E, which enters the undercut in the upper band; the *clearance* F, *for the windage screw knob; air chamber* H, and *recess* I, *for the* HAND GUARD CLIPS which are shown

Fig. 86.

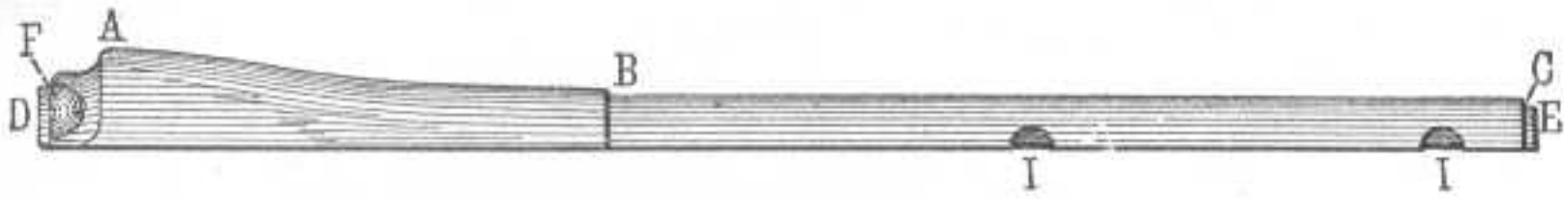


Fig. 87.

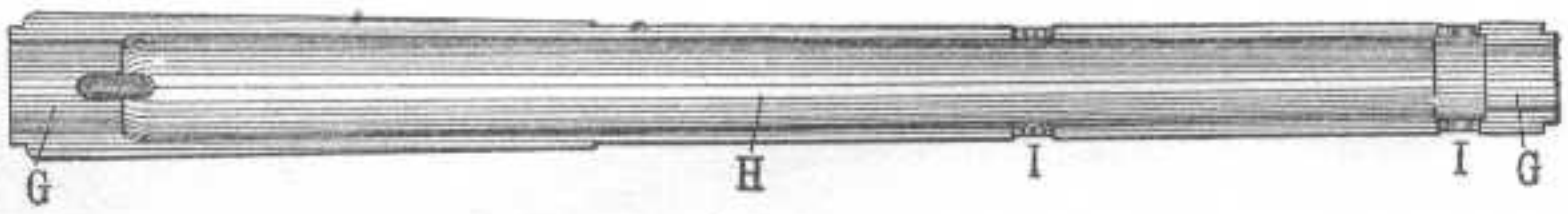
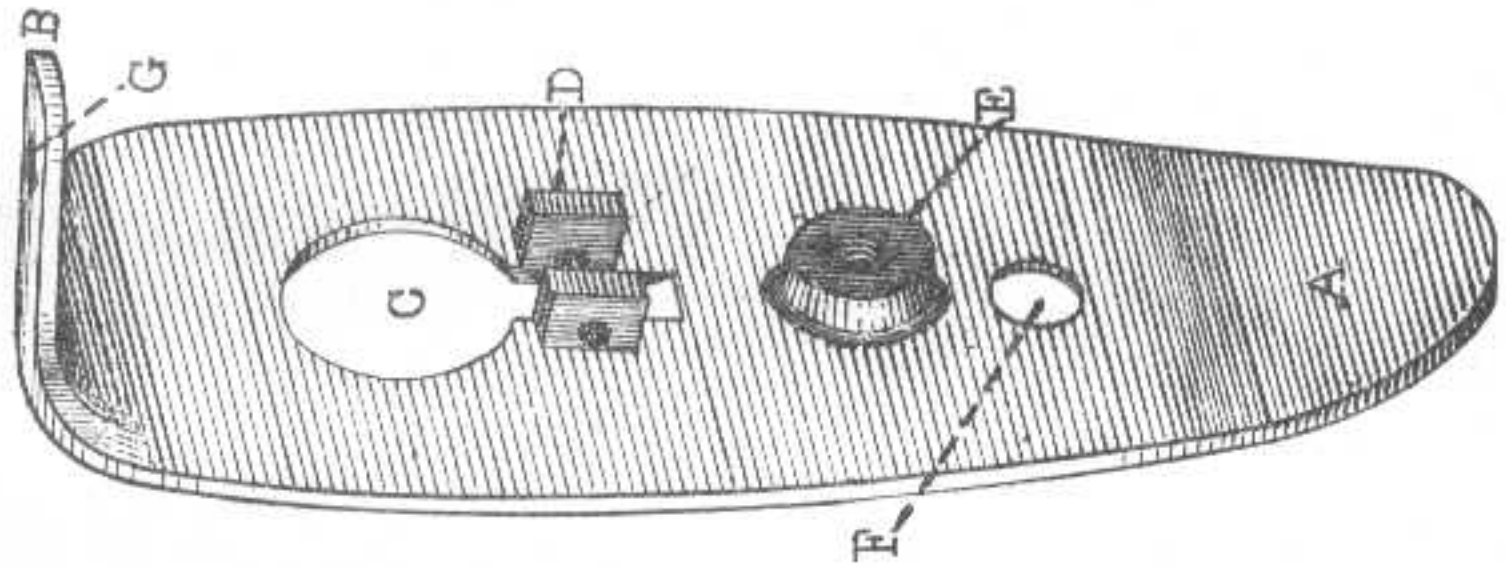


Fig. 88.

in Fig. 88. The hole shown in the cut near the rear end of the inner surface is made for convenience in manufacture. At the *swell* A a groove is cut for sight clearance.

Fig. 89.



The BUTT PLATE is represented in Fig. 89 and Fig. 90. The parts are *toe* A; *tang* B; *cap hole* C; *cap ears* D, through which are the *pin holes; spring lug* E; *hole for butt plate screw, large,* F; and *hole for butt*

Fig. 90.

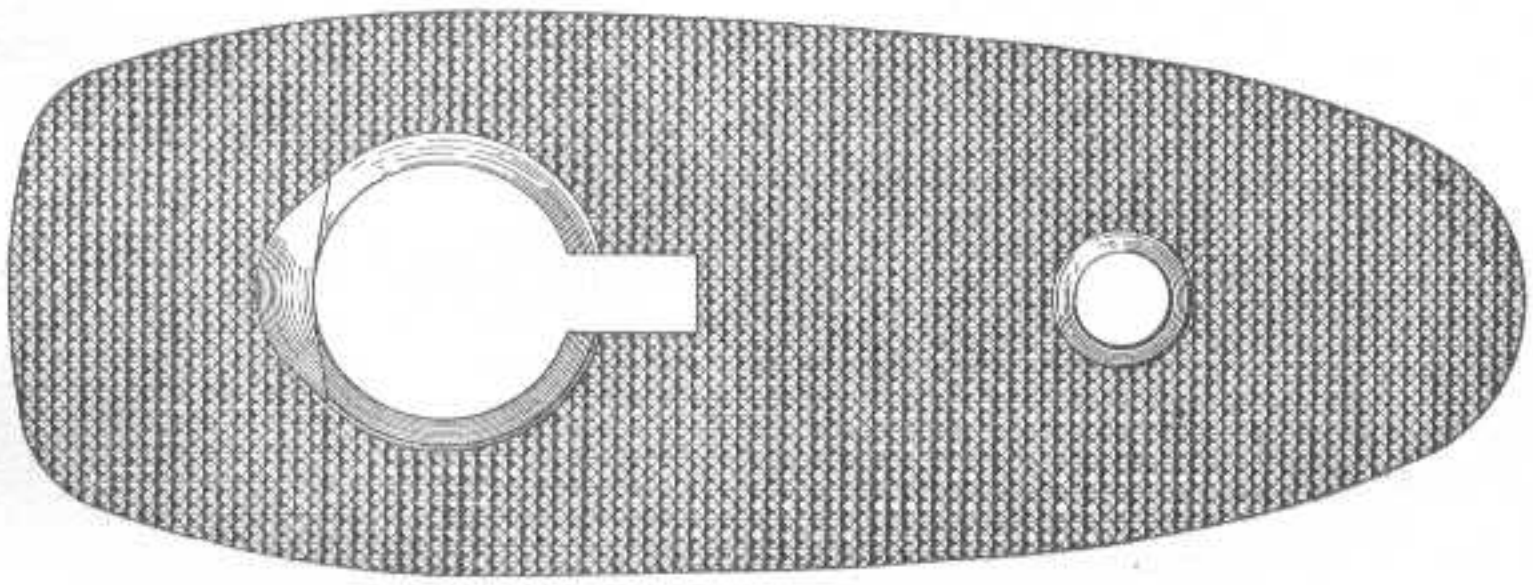


plate screw, small, G. A notch is cut into the edge of the cap hole to facilitate the opening of the cap. For this purpose the flange of the head of a cartridge case can be used. The butt plate is checked for the purpose of insuring a firm seat at the shoulder in firing.

The BUTT PLATE CAP, Fig. 91, Fig. 92, and Fig. 93, has the *pin hole* A and the *thumb notch* B. The cap is hinged between the ears of the butt plate on the butt plate pin and is retained either closed or open by the free end of the BUTT PLATE SPRING, Fig. 96, which bears

Fig. 91.

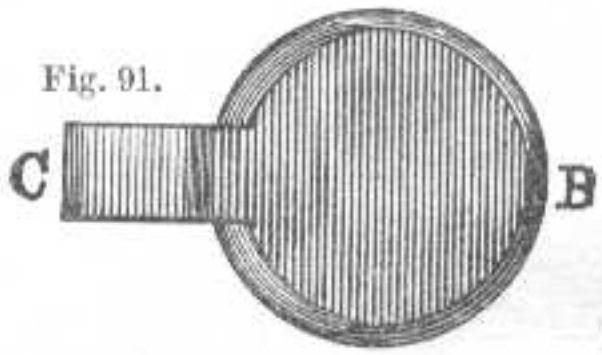


Fig. 92.

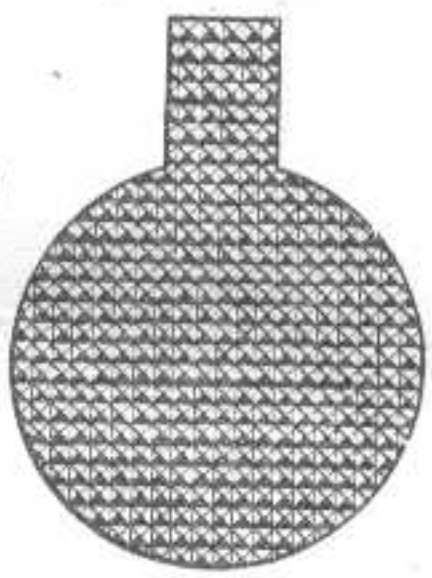


Fig. 93.

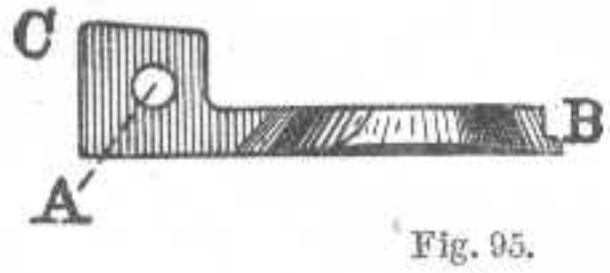


Fig. 96.

Fig. 94.

Fig. 95.

on the *heel* C. The cap is checked to match with the butt plate.

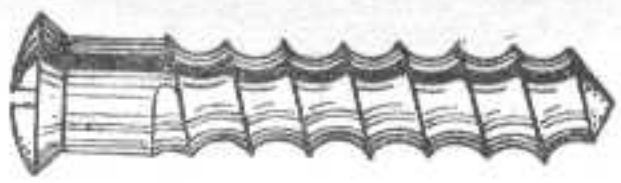
The BUTT PLATE PIN, Fig. 95, after being driven into the holes in the ears of the butt plate and cap, has its ends slightly upset.

The BUTT PLATE SPRING SCREW, Fig. 94, secures the spring to the lug on the butt plate and is firmly screwed against the spring.

Fig. 97.

Fig. 98.

Fig. 99.



The STOCK SCREW AND NUT, Fig. 97, are assembled transversely through the stock between the magazine well and slot for trigger. The thread end of stock screw is upset when in place.

Fig. 100.

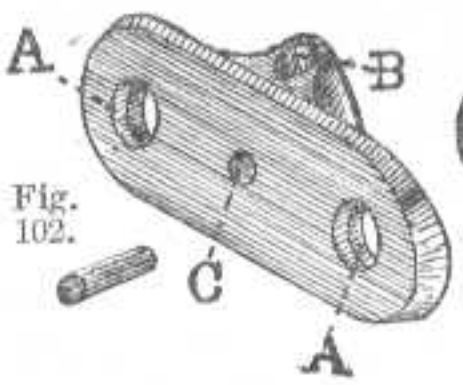
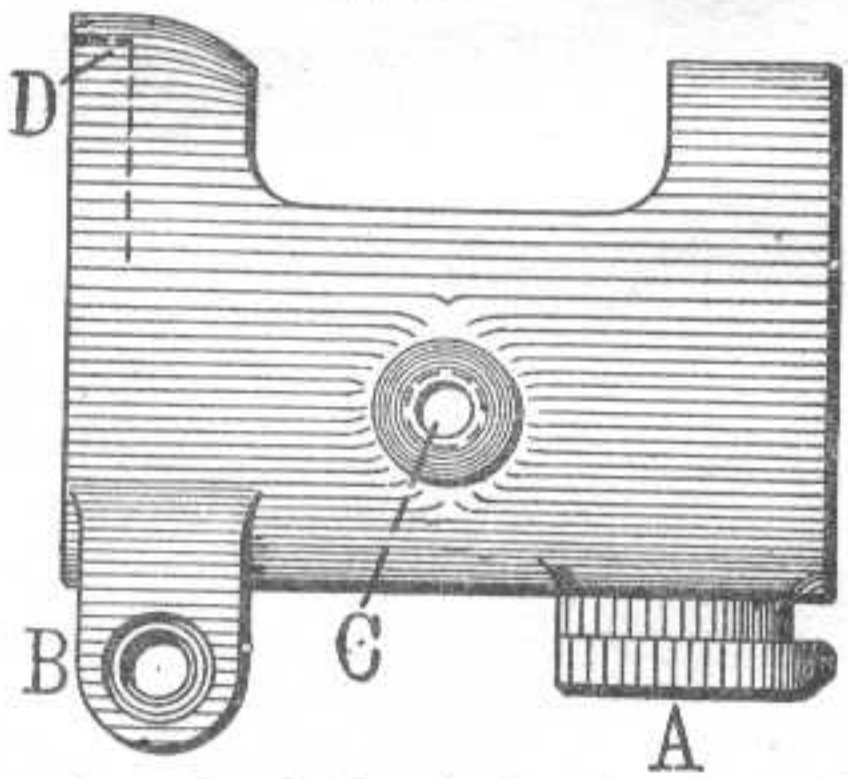


Fig. 101.

Fig. 102.

Fig. 103.



The large and small BUTT PLATE SCREWS, Figs. 98 and 99, secure the butt plate to the stock.

The BUTT SWIVEL includes the plate, swivel, and pin assembled.

The BUTT SWIVEL PLATE, Fig. 100, has the *holes* A for the swivel screws; B for the swivel, and C for the swivel pin.

The BUTT SWIVEL, Fig. 101, is retained in the plate by the BUTT SWIVEL PIN, Fig. 102.

The BUTT SWIVEL SCREWS are the same as the butt plate screw small (see Fig. 98).

The UPPER BAND, Fig. 103, has the *bayonet lug* A; the *ears* B, in which are the holes for the stacking swivel screw; the *upper band screw hole* C, and the *undercut* D, for the front tenon on the hand guard.

Fig. 104.

Fig. 105.

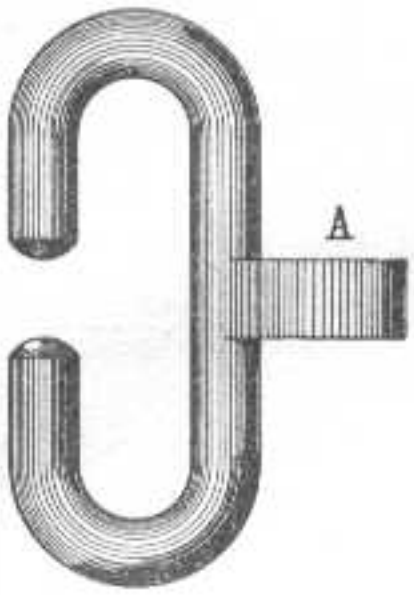


Fig. 106.

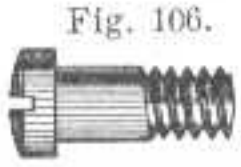
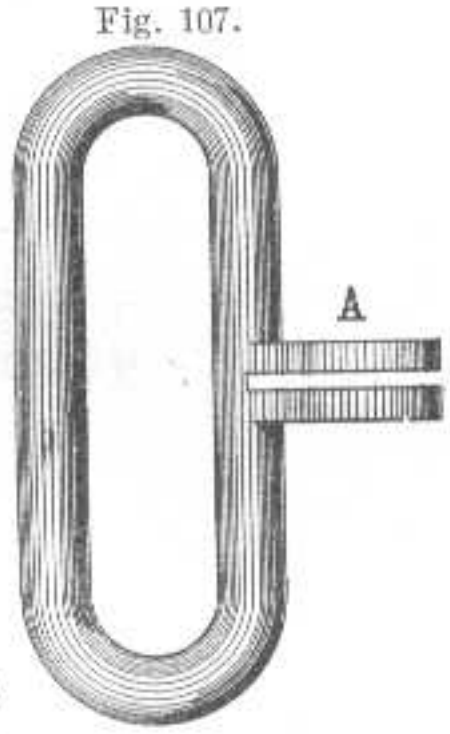


Fig. 107.



The UPPER BAND SCREW, Fig. 104, secures the band to the stock, the thread under the head engaging the hole in right side of the band.

The STACKING SWIVEL, Fig. 105, is hinged by the *lug* A between the *ears* B, of the upper band, on the STACKING SWIVEL SCREW, which is like the screw shown in Fig. 106, but slightly longer. The threaded end of the screw is upset, after assembling, to prevent its being lost.

The LOWER BAND SWIVEL, Fig. 107, is hinged by its *lug* A, between the ears of the lower band, on the LOWER BAND SCREW, Fig. 106. The threaded end of the screw is upset when in place.

Fig. 108.

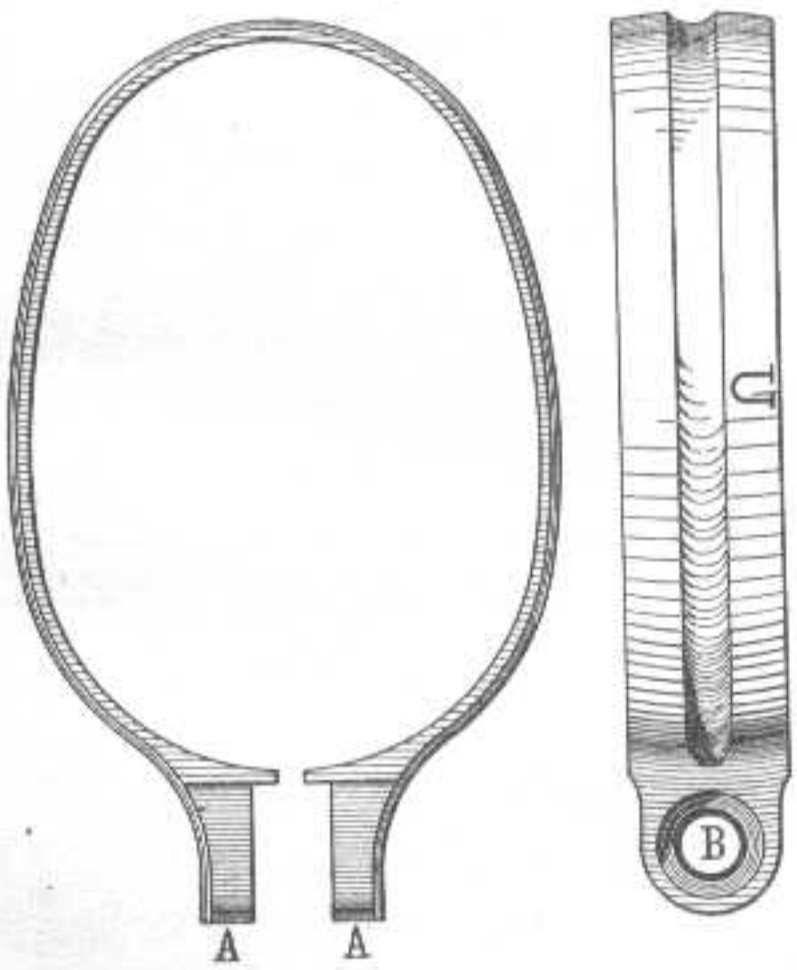
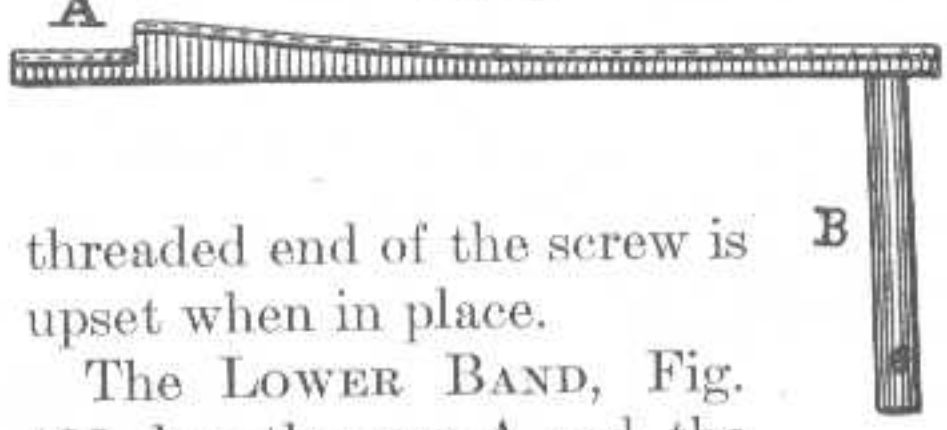


Fig. 109.



The LOWER BAND, Fig. 108, has the *ears* A and the *screw holes* B; the front or upper end is designated by the letter "U." The lower band and swivel are split between the ears in order to give better adjustment to the stock and hand guard and permit removal of the band without marring the stock.

The LOWER BAND SPRING, Fig. 109, has the *notch* A, which holds the band in place, and the *spindle* B, which retains the spring in the stock.

THE BAYONET, MODEL OF 1905, AND BAYONET SCABBARD.

The BAYONET, Model of 1905, is shown in Fig. 110, right side view, with guard and tang, cross-sectioned, and right grip removed, and in Fig. 111, upper or back view, with blade cut off a short distance from the guard.

The *blade* A, the *tang* B, and the *pommel* C are forged in one piece; the front or lower edge is sharp along its entire length and the back for a distance of 5 inches from the point.

Fig. 110.

The blade is stamped on its left side with the ordnance escutcheon and the initials of the place of manufacture, and on the right side with the letters "U. S." and the serial number.

Immediately in the rear of the *guard* D the tang swells and is recessed to receive the *scabbard catch* E and the *bayonet spring* F. The swell in the tang also serves as a seat for the guard, which is riveted to the blade in manufacture.

The opening in the tang and pommel for the *bayonet catch* H connects with the recess in the swell of the tang and allows the front end of the bayonet catch to enter its seat in the bayonet scabbard catch. The *undercut groove* I receives the stud on the upper band when the bayonet is fixed, the bayonet being held in place by the bayonet catch projecting through the *hole* K.

Fig. 112.

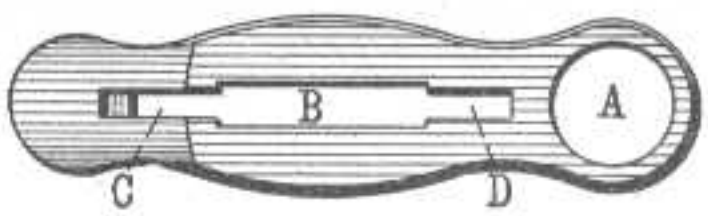


Fig. 113.

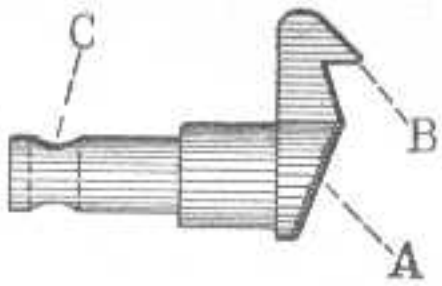
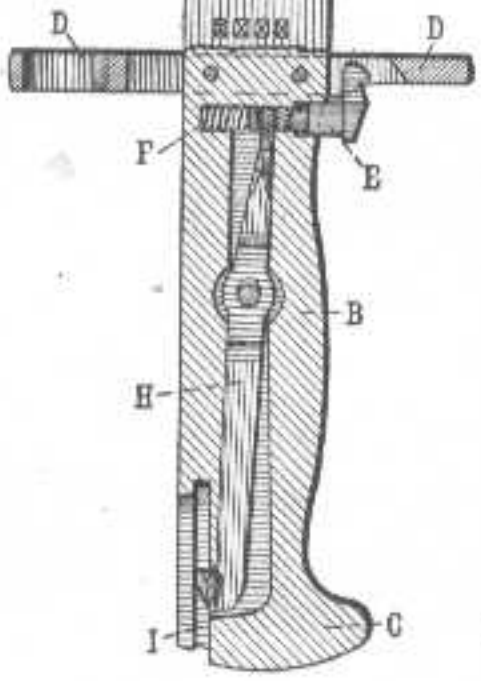
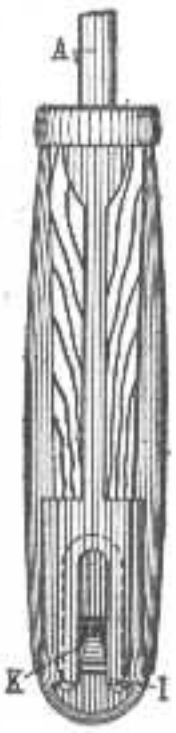


Fig. 114.

The BAYONET GUARD, Fig. 112, rear view, has the *barrel hole* A; the *mortise* B, for the blade; the *cut* C, for the bayonet scabbard catch and scabbard mouthpiece hook; and the *clearance cut* D, for the scabbard mouthpiece hook. There are also two holes for the bayonet rivets not shown in cut, by means of which the bayonet guard is riveted to the blade.

Fig. 111.





The BAYONET SCABBARD CATCH, Fig. 113, side view, has the *thumb piece* A; the *hook* B, which retains the bayonet in the scabbard by engaging the scabbard mouthpiece hook; and the *hole* C, which receives the point of the bayonet catch.

The BAYONET SPRING is shown in Fig. 114.

The BAYONET CATCH, Fig. 115, side view, has the *point* A; the *hole* B, which is a clearance for the bayonet screw; and the *hook* C, which, projecting from the *hole* K, in the

pommel, engages the bayonet lug on the upper band and retains the bayonet in its place on the rifle.

The BAYONET GRIP, RIGHT, outside view, is shown in Fig. 118. The hole is counterbored to receive the BAYONET WASHER, Fig. 119. A corresponding hole in the left grip is counterbored to receive the BAYONET NUT, Fig. 120. The washer in the right grip receives the head, and the nut in the left grip receives the thread of the BAYONET SCREW, Fig. 121, by means of which the grips are attached to the tang of the bayonet. The inner surfaces of the BAYONET GRIPS, RIGHT and LEFT, are shown in Figs. 117 and 116, respectively; there are the *clearance cuts*, A for the *bayonet catch*, B for the shoulder on the *pommel*, C for the swell of the tang, and the *hole* D for the bayonet screw.

Fig. 115.

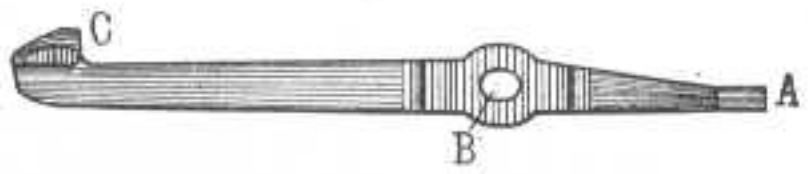
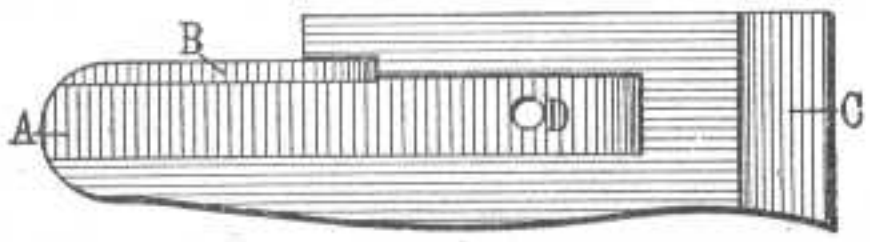


Fig. 116.



The BAYONET SCABBARD, Model of 1905, Fig. 122, side view and edge view, and Fig. 123, cross section of upper end, has the *wooden body* A, made in two pieces and glued together; the *rawhide cover* B, which increases the strength of the scabbard; the *leather cover* C; the *mouthpiece bushing* P; the *mouthpiece top* D; the *mouthpiece body* Q, riveted to the wooden body by the *rivets* E E; the *mouthpiece hooks* F F, either of which by its engagement with the hook of the bayonet scabbard catch on the bayonet retains the bayonet in its place in the scabbard; the *scabbard hook* G, attached to the body by the *hook rivet* H, which passes through the *inside* and *outside washers* I and K, and the *stop washer* L; the *fastener* M, and the *drain eyelet* N. An offset on the lower end of the hook, traveling in its recess in the stop washer, limits the oscillation of the hook to 50 degrees on each side of the vertical.

Fig. 117.

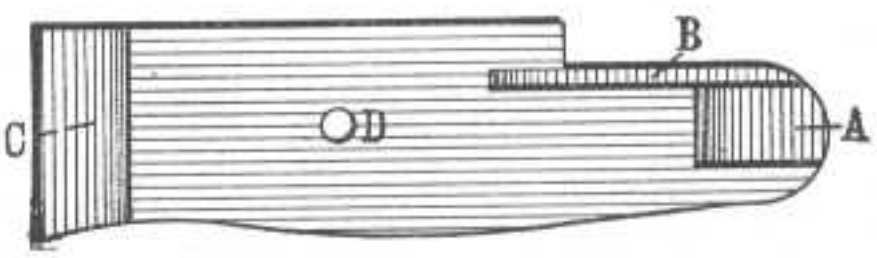


Fig. 121.

Fig. 118.

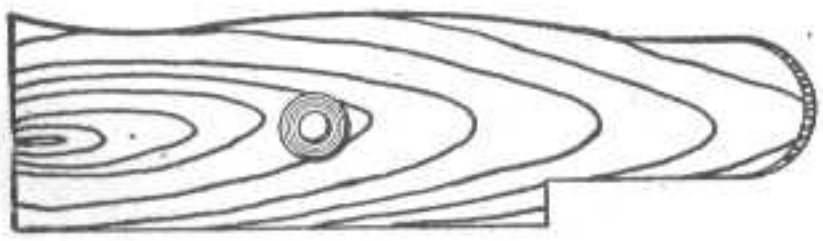


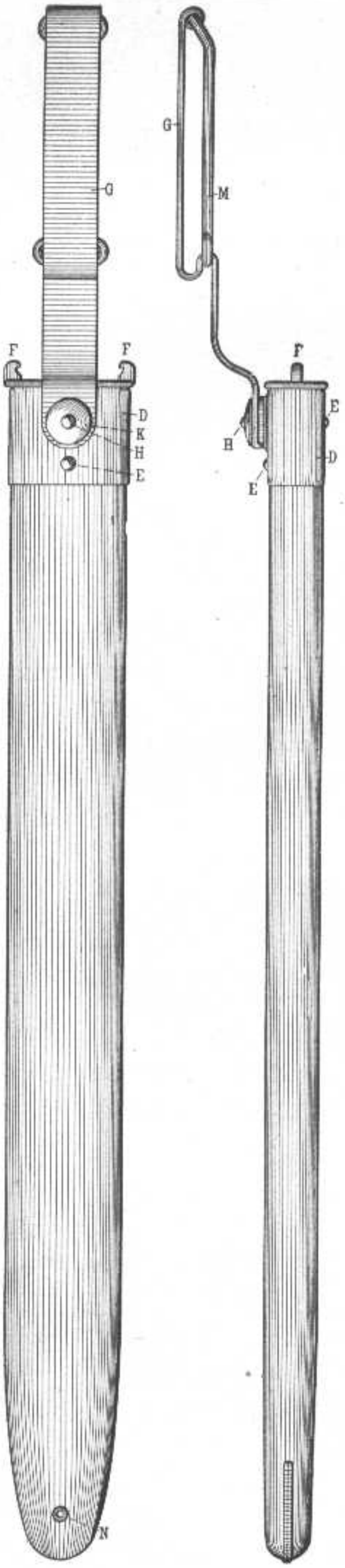
Fig. 119.

Fig. 120.

NOTE.—The cavalry is equipped with the United States rifle, caliber .30, model of 1903, but without the bayonet or bayonet scabbard.

The BAYONET SCABBARD, Model of 1910, Fig. 124 and Fig. 125, consists of a wooden body covered with rawhide, over which is sewed

Fig. 122.



Model of 1905.

Fig. 123.

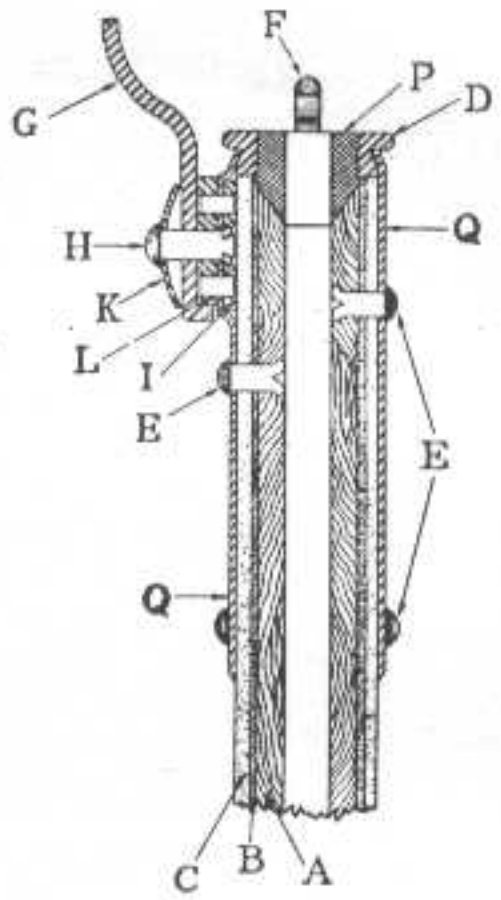
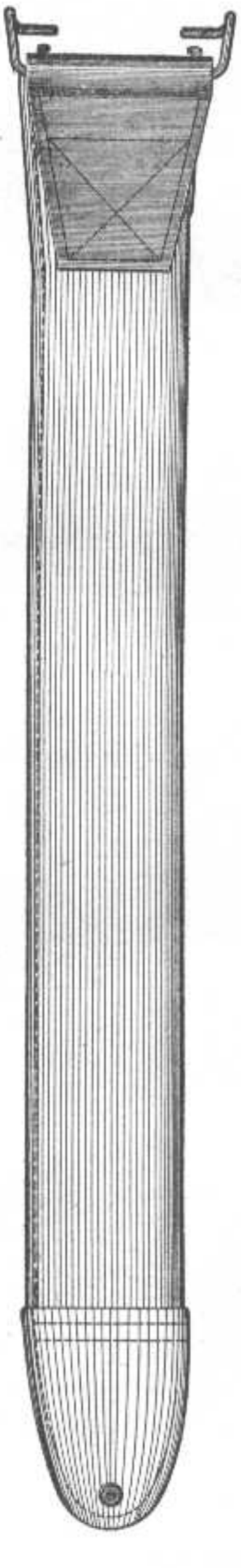
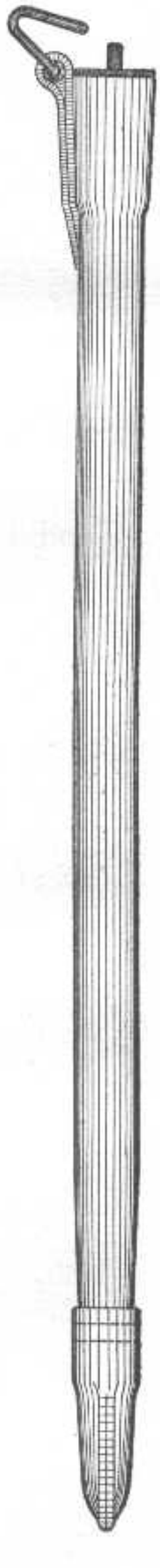


Fig. 124.



Model of 1910.

Fig. 125.

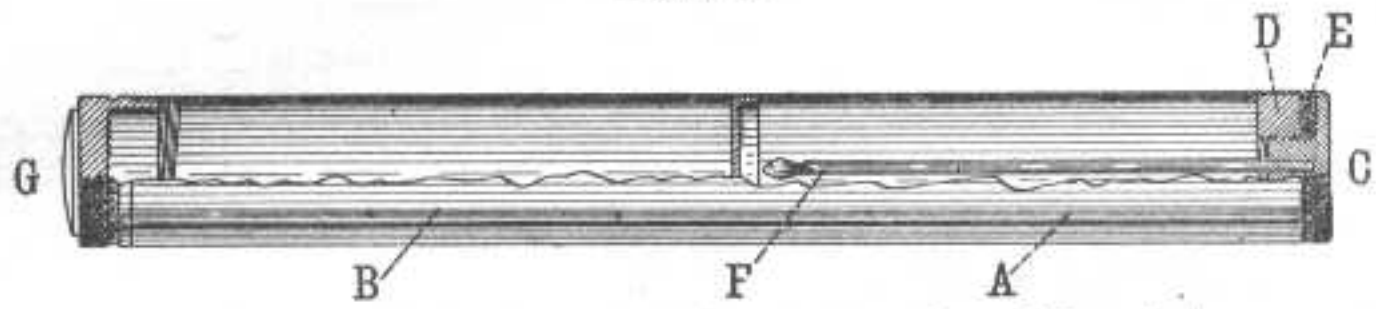


a duck cover, or is fitted a woven fabric cover, olive-drab in color. The bayonet is held fast in the scabbard by means of two mouthpiece hooks on opposite sides of the mouthpiece top. The scabbard is fastened to the belt or pack of the soldier by a double-hook which is attached to the scabbard by the duck hanger sewed to the cover.

APPENDAGES.

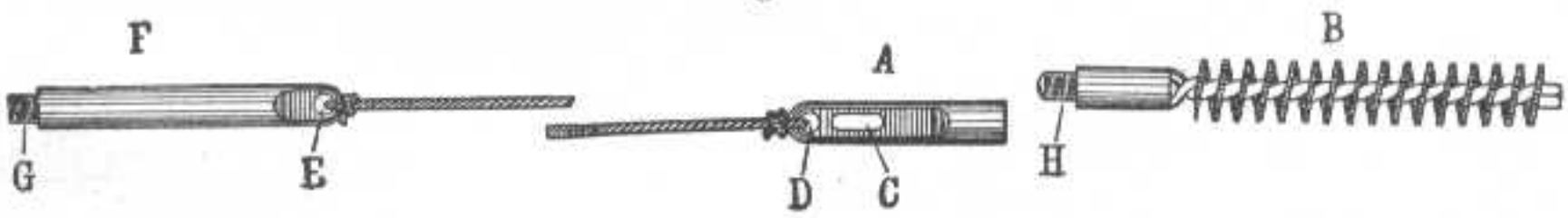
The DRIFT SLIDE No. 4 and DRIFT SLIDE No. 6 are furnished, two of each for every ten rifles. The two drift slides have peepholes respectively 0.04 inch and 0.06 inch in diameter; and have drift slide pins assembled to them.

Fig. 126.



The OILER AND THONG CASE, Fig. 126, furnished for every alternate rifle, is carried in the butt of the stock. It consists of a nickel-plated brass tube, about 6 inches long and $\frac{3}{4}$ inch in diameter, divided transversely, near the center, by a partition, with both ends fitted with screw caps. In one section is carried a small supply of sperm oil, and in the other the thong and thong brush used for cleaning the bore of the rifle. The cap on the oil section is fitted with a wire, flattened at its point, which reaches to the bottom of the section and is used for applying oil, a drop or more at a time. *The oil is only for the lubrication of working parts.* The cap is also provided with a leather washer to prevent leakage. The cap on the thong section

Fig. 127.

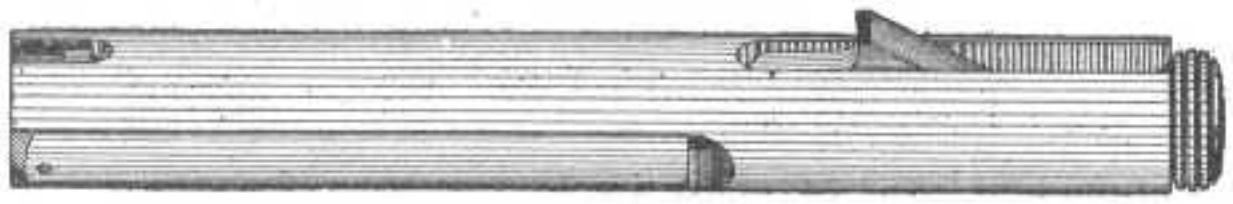


has a leather pad on its outer surface, which prevents the noise that would result from the oiler striking the butt plate cap. The oiler should always be inserted in the stock so that the leather-tipped cap will be next to the butt plate cap. The parts as shown in cut are: *Thong case body* A and B; *oiler collar* D, into which the cap is screwed; *oiler cap washer* E; *oil dropper* C and F, and *thong case cap* G.

The THONG AND THONG BRUSH are shown in Fig. 127. The *thong tip* A, into which the *thong brush* B is screwed, is provided with a *rag slot* C; the thong cord is knotted in the *hole* D in the tip, and also in the *hole* E in the weight. In cleaning the bore by means of the thong, the brush or rag should always be drawn from the muzzle toward the breech.

The SPARE PART CONTAINER, Fig. 128, furnished for every alternate rifle, consists of a cylindrical block of wood (hard maple), 5.8 inches long and 0.785 inch in diameter. Slots and recesses are cut

Fig. 128.



for holding three spare parts—a striker, an extractor, and a firing pin. The container is carried in the butt of the stock.

The FRONT SIGHT COVER, Fig. 129, right side view, and Fig. 130, front view, is made of sheet steel and pressed into shape. It is then case-hardened, giving it sufficient spring to cause it to hug closely the barrel and front sight stud, thereby retaining its position on the barrel.

Fig. 129.

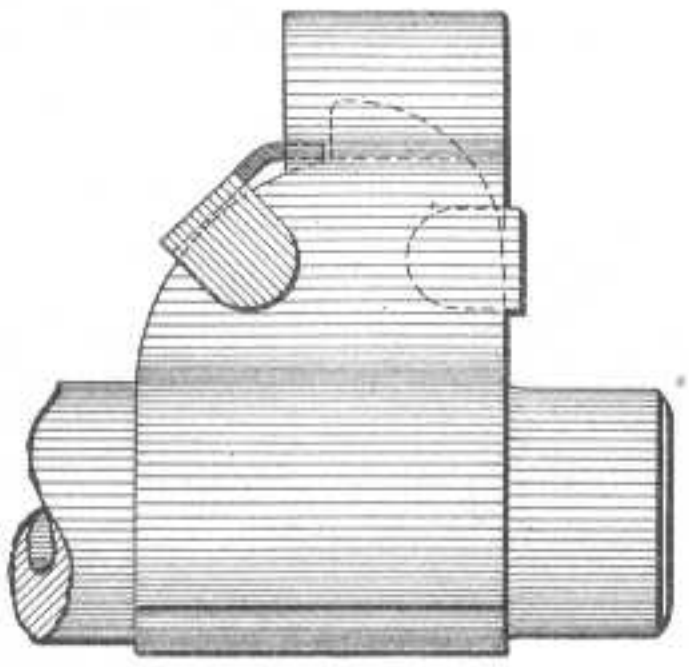
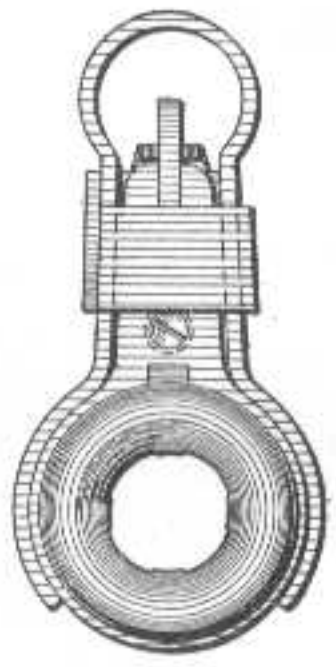


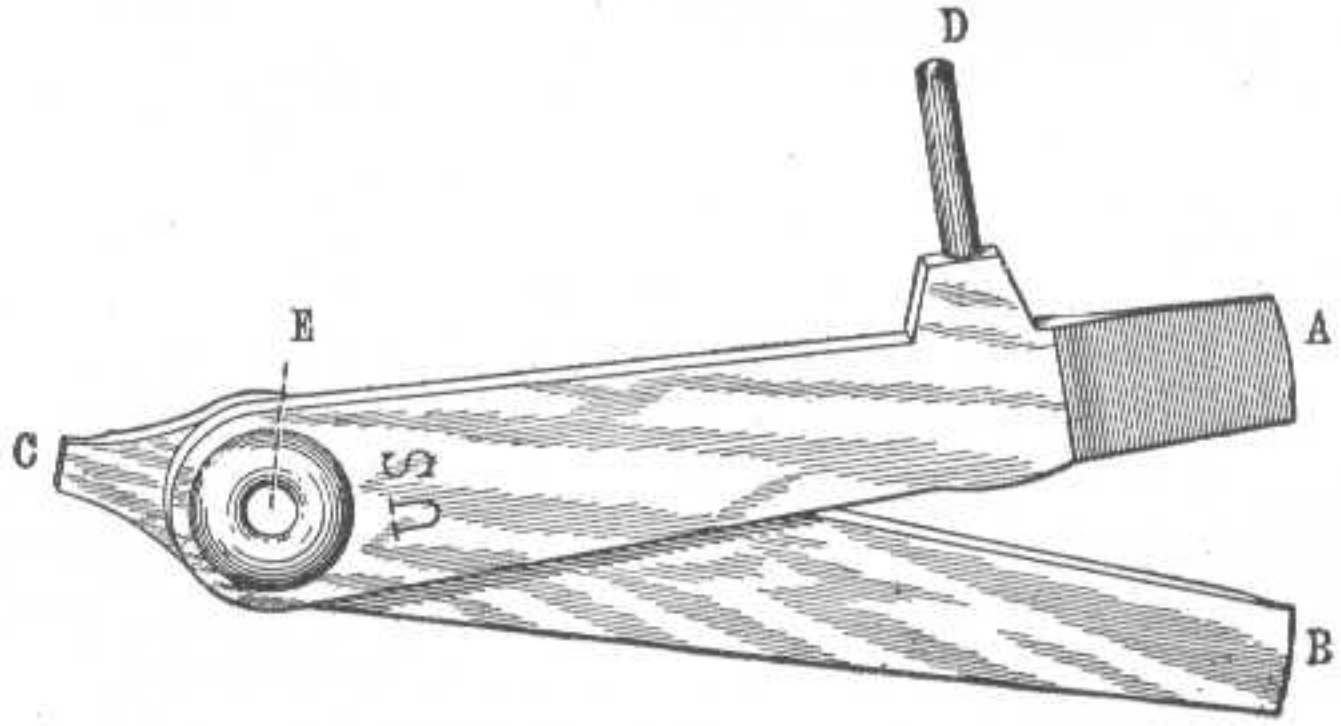
Fig. 130.



ACCESSORIES.

The SCREW-DRIVER, Fig. 131, has the *large blade* A, the *small blade* B, the *spur* C, the *pin* D, and the *rivet* E. The large blade should be used for the large butt plate screw, the butt plate spring screw, and the guard screws; the small blade for all other screws, except the cut-off screw, for which

Fig. 131.

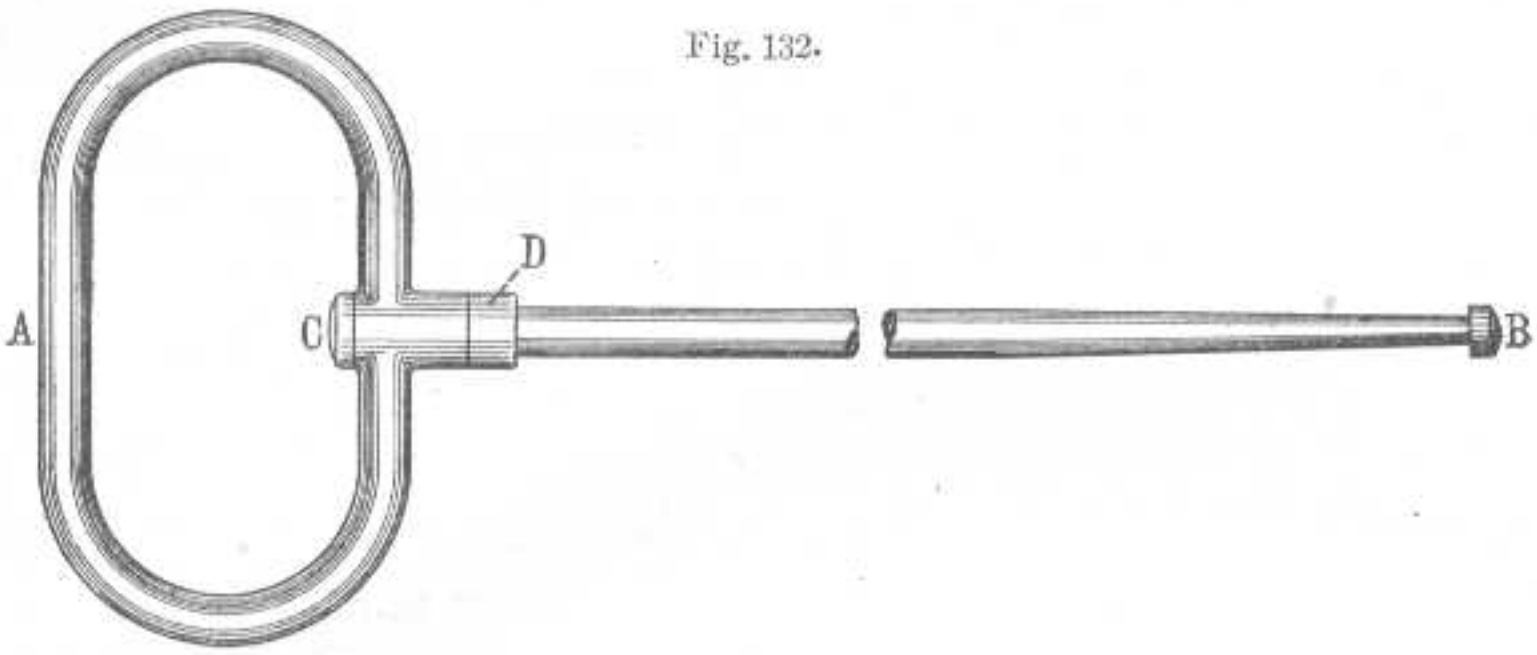


the spur should be used. The pin serves as a drift in removing the butt plate cap, ejector, floor plate catch, sear and trigger pins, and the lower band spring.

The CLEANING ROD (old model), Fig. 132, is made of brass rod, 0.25 inch in diameter, and of sufficient length so that the bore can

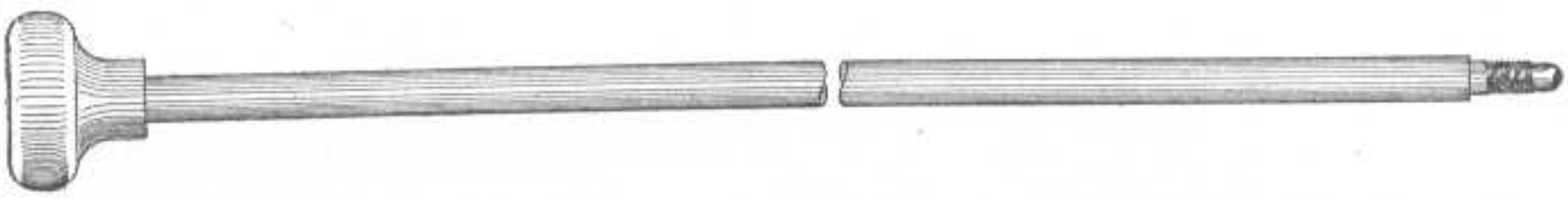
be cleaned from the breech end. It has the *handle* A, the *knob* B, the *steel collar* C, riveted to the rod, and the *brass sleeve* D, pinned to the rod. The handle swivels on the rod between the collar and the sleeve.

Fig. 132.



The CLEANING ROD, Model of 1910, is a jointed brass rod, 0.25 inch in diameter and 35.68 inches long. It is made up of three main sections; the handle section, Fig. 133, the second section, Fig. 134,

Fig. 133.



and the swivel section, Fig. 135. To the handle section is pinned a knob of an aluminum alloy. A brass swivel, Fig. 136, is attached to the swivel section by means of the swivel screw, Fig. 137. This

Fig. 134.

cleaning rod is provided with a patch section, Fig. 138, and also a brush section, Fig. 139, to which can be attached the thong brush issued with the rifle. One cleaning rod, model of 1910, with a cleaning

Fig. 135.

rod case of olive-drab cotton webbing, is packed with each 10 rifles, but issues are based on one cleaning rod case for every eight rifles.

Fig. 136. Fig. 137. Fig. 138. Fig. 139.

THE ASSEMBLED PARTS AND THEIR OPERATIONS.

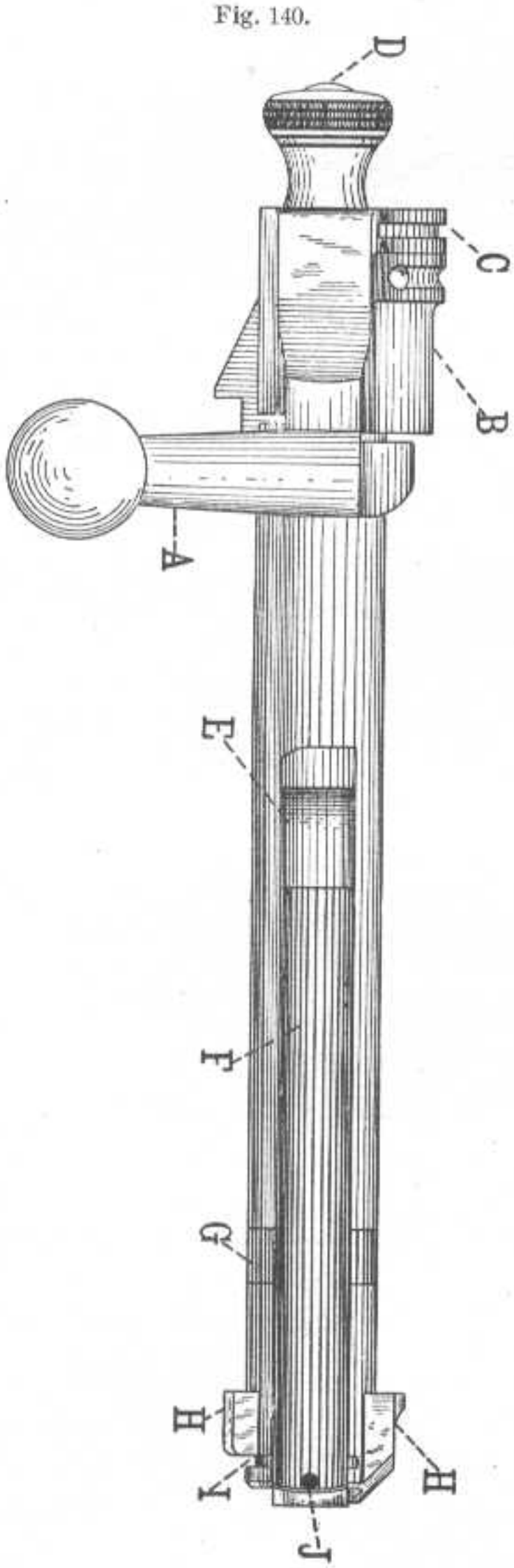
Most of the operating parts may be included under the BOLT MECHANISM and MAGAZINE MECHANISM.

The BOLT MECHANISM consists of the bolt, sleeve, sleeve lock, extractor, extractor collar, safety lock, firing pin, firing-pin sleeve,

striker, and mainspring. It is shown, assembled, in Fig. 140. The parts shown in the cut are *handle* A, *sleeve* B, *safety lock* C, *cocking piece* D, *safety lug* E, *extractor* F, *extractor collar* G, *locking lugs* H, *extractor tongue groove* I, and *gas escape hole* J.

The bolt moves backward and forward and rotates in the well of the receiver; it carries a cartridge, either from the magazine, or one placed by hand in front of it, into the chamber and supports its head when fired.

Fig. 140.



The sleeve unites the parts of the bolt mechanism, and its rotation with the bolt is prevented by the lugs on its sides coming in contact with the receiver.

The hook of the extractor engages in the groove of the cartridge case and retains the head of the latter in the countersink of the bolt until the case is ejected.

The safety lock, when turned to the left, is inoperative; when turned to the right—*which can only be done when the piece is cocked*—the point of the spindle enters its notch in the bolt and locks the bolt; at the same time its cam forces the cocking piece slightly to the rear, out of contact with the sear, and locks the firing pin.

The bolt mechanism operates as follows: To open the bolt, raise the handle until it comes in contact with the left side of the receiver and pull directly to the rear until the top locking lug strikes the cut-off.

Raising the handle rotates the bolt and separates the locking lugs from their locking shoulders in the receiver, with which they have been brought into close contact by the powder pressure. This rotation causes the cocking cam of the bolt to force the firing pin to the rear, drawing the point of the striker into the bolt, rotation of the firing pin being prevented by the lug on the cocking piece projecting, through the slot in the sleeve, into its groove in the receiver. As the sleeve remains longitudinally stationary with reference to the bolt, this rearward motion of the firing pin, and consequently of the striker, will

start the compression of the mainspring, since the rear end of the latter bears against the front end of the barrel of the sleeve and its front end against the rear end of the firing pin sleeve.

When the bolt handle strikes the receiver, the locking lugs have been disengaged, the firing pin has been forced to the rear until the sear notch of the cocking piece has passed the sear nose, the cocking piece nose has entered the cock notch in the rear end of the bolt, the sleeve lock has engaged its notch in the bolt, and the mainspring has been almost entirely compressed.

During the rotation of the bolt a rear motion has been imparted to it by its extracting cam coming in contact with the extracting cam of the receiver, so that the cartridge case will be started from the chamber.

The bolt is then drawn directly to the rear, the parts being retained in position by the cocking piece nose remaining in the cock notch and locked by the sleeve lock engaging its notch in the bolt.

To close the bolt, push the handle forward until the extracting cam on the bolt bears against the extracting cam on the receiver, thereby unlocking the sleeve from the bolt, and turn the handle down. As the handle is turned down the cams of the locking lugs bear against the locking shoulders in the receiver, and the bolt is forced slightly forward into its closed position. As all movement of the firing pin is prevented by the sear nose engaging the sear notch of the cocking piece, this forward movement of the bolt completes the compression of the mainspring, seats the cartridge in the chamber, and, in single loading, forces the hook of the extractor into the groove of the cartridge case. In loading from the magazine the hook of the extractor, rounded at its lower edge, engages in the groove of the top cartridge as it rises from the magazine under the action of the follower and magazine spring.

The position then occupied by the parts is shown in Fig. 141, and the piece is ready to fire.

To pull the trigger, the finger piece must be drawn to the rear until contact with the receiver is transferred from its bearing to the heel, which gives a creep to the trigger, and then until the sear nose is withdrawn from in front of the cocking piece.

Just before the bolt is drawn fully to the rear, the top locking lug strikes the heel of the ejector, throwing its point suddenly to the right in the lug slot. As the bolt moves fully to the rear, the rear face of the cartridge case strikes against the ejector point and the case is ejected, slightly upward and to the right, from the receiver.

Double loading from the magazine is prevented by the extractor engaging the cartridge case as soon as it rises from the magazine and holding its head against the face of the bolt until ejected.

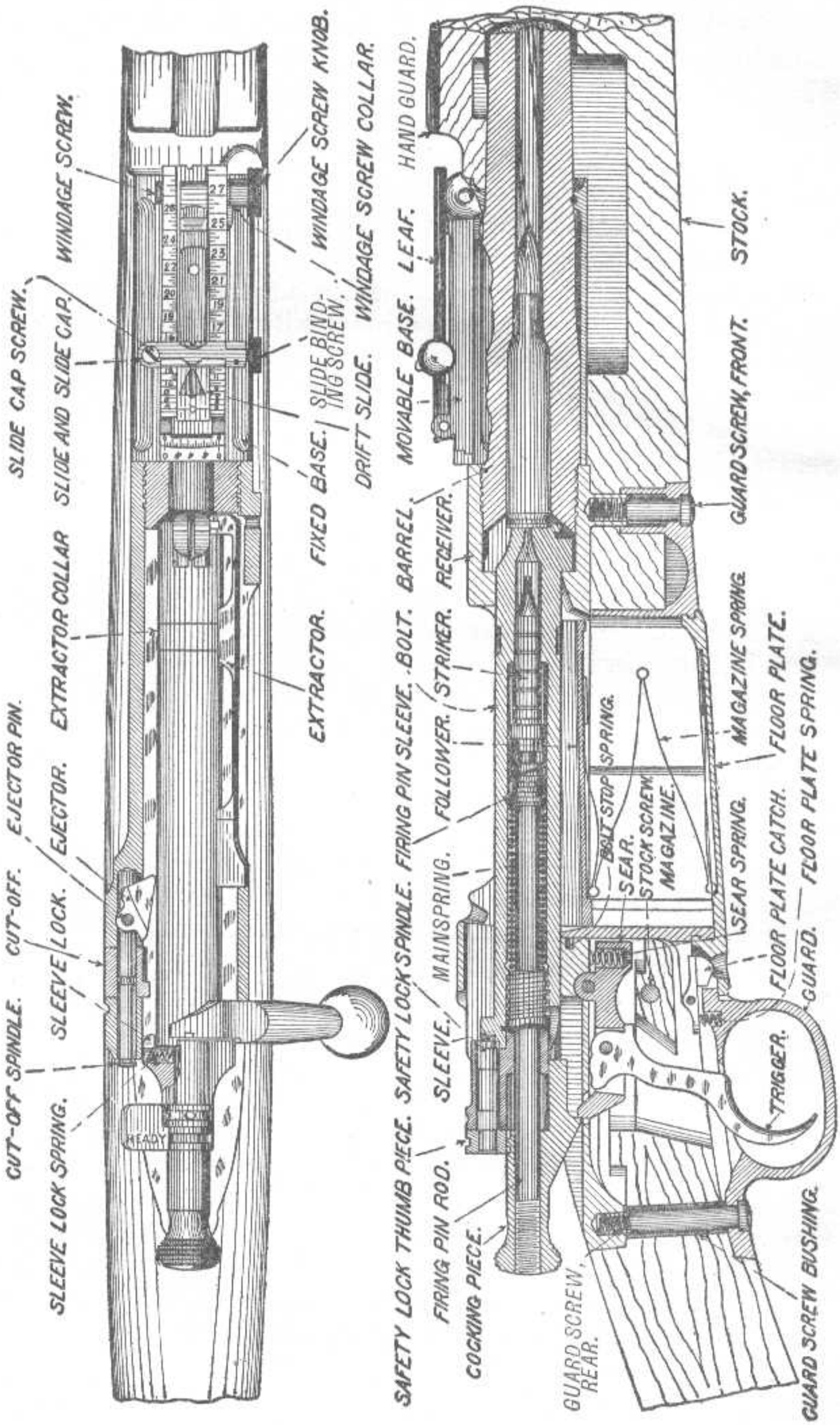
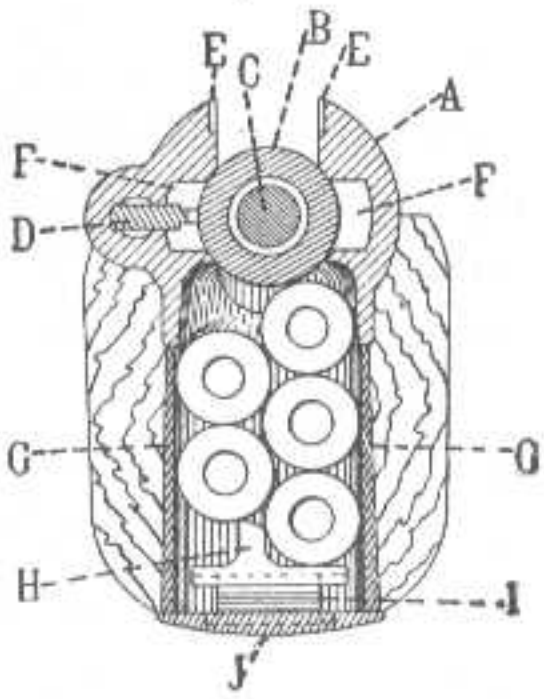

SLIDE CAP SCREW.
WINDAGE SCREW.
SLIDE AND SLIDE CAP.
WINDAGE SCREW KNOB.
BASE.
SLIDE BINDING SCREW.
DRIFT SLIDE.
WINDAGE SCREW COLLAR.
CUT-OFF SPINDLE.
CUT-OFF.
EJECTOR PIN.
SLEEVE
LOCK.
EJECTOR.
EXTRACTOR COLLAR
SLIDE
EXTRACTOR.
FIXED BASE.
MOVABLE BASE.
LEAF.
HAND GUARD.
STOCK.
SAFETY LOCK SPINDLE.
FIRING PIN SLEEVE.
BOLT.
BARREL.
SLEEVE.
MAINSPRING.
FOLLOWER.
STRIKER.
RECEIVER.
GUARD SCREW, FRONT.
BOLT STOP SPRING.
SEAR.
STOCK SCREW
MAGAZINE.
MAGAZINE SPRING.
GUARD.
SEAR SPRING.
FLOOR PLATE.
FLOOR PLATE CATCH.
TRIGGER.
GUARD. — FLOOR PLATE SPRING.
SLEEVE LOCK SPRING.
SAFETY LOCK THUMB PIECE.
FIRING PIN ROD.
COCKING PIECE.
GUARD SCREW, REAR.
GUARD SCREW BUSHING.

Fig. 141.

It will be noted that in this system of bolt mechanism the compression of the mainspring, the seating of the cartridge in and the starting of the empty case from the chamber are entirely done by the action of cams.

The piece may be cocked either by raising the bolt handle until it strikes the left side of the receiver and then immediately turning it down or by pulling the cocking piece directly to the rear.

Fig. 142.



In firing, unless the bolt handle is turned fully down, the cam on the cocking piece will strike the cocking cam on the bolt, and the energy of the mainspring will be expended in closing the bolt, instead of on the primer; this prevents the possibility of a cartridge being fired until the bolt is fully closed.

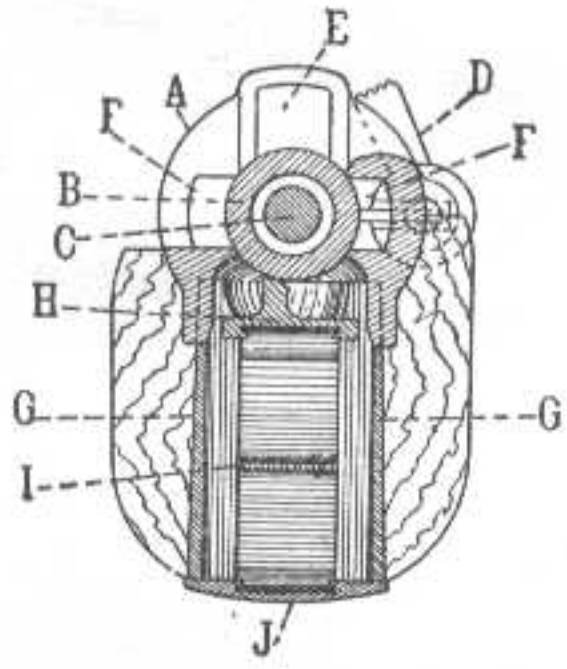
The opening and closing of the bolt should each be done by one continuous motion.

The MAGAZINE MECHANISM includes the floor plate, follower, magazine spring, and cut-off.

Fig. 142 represents a cross section through the ejector with the magazine loaded. The parts shown are *receiver* A, *bolt* B, *firing pin* C, *ejector* D, *clip slots* E, *bolt locking lug channels* F, *magazine* G, *follower* H, *magazine spring* I, and *floor plate* J.

Fig. 143 shows a cross section through the magazine with the magazine empty, and with cut-off "on," shown in projection. The parts are *receiver* A, *bolt* B, *firing pin* C, *cut-off* D, *rear lug slot* E, *bolt locking lug channels* F, *magazine* G, *follower* H, *magazine spring* I, and *floor plate* J.

Fig. 143.



To charge the magazine, see that the cut-off is turned up showing "on," draw the bolt fully to the rear, insert the cartridges from a clip, or from the hand, and close the bolt. To charge the magazine from a clip, place either end of a loaded clip in its seat in the receiver and, with the thumb of the right hand, press the cartridges down into the magazine until the top cartridge is caught by the right edge of the receiver. The manner in which the cartridges arrange themselves in the magazine and the position of the follower and compressed magazine spring are shown in Fig. 142. The cartridge ramp guides the bullet and cartridge case into the chamber. The magazine can be filled, if partly filled, by inserting cartridges one by one.

Pushing the bolt forward, after charging the magazine, ejects the clip.

When the cut-off is turned down, the magazine is "off." The bolt can not be drawn fully back, and its front end projecting over the rear end of the upper cartridge holds it down in the magazine below the action of the bolt. The magazine mechanism then remains inoperative, and the arm can be used as a single-loader, the cartridges in the magazine being held in reserve. The arm can readily be used as a single-loader with the magazine empty.

When the cut-off is turned up, the magazine is "on;" the bolt can be drawn fully to the rear, permitting the top cartridge to rise high enough to be caught by the bolt in its forward movement. As the bolt is closed this cartridge is pushed forward into the chamber, being held up during its passage by the pressure of those below. The last one in the magazine is held up by the follower, the rib on which directs it into the chamber.

In magazine fire, after the last cartridge has been fired and the bolt drawn fully to the rear, the follower rises and holds the bolt open to show that the magazine is empty.

PRECAUTIONS.

If it is desired to carry the piece cocked, with a cartridge in the chamber, the bolt mechanism should be secured by turning the safety lock to the right. Under no circumstances should the firing pin be let down by hand on a cartridge in the chamber.

To obtain positive ejection, and to insure the bolt catching the top cartridge in magazine, when loading from the magazine, the bolt must be drawn fully to the rear in opening it.

When the bolt is closed, or slightly forward, the cut-off may be turned up or down, as desired. When the bolt is in its rearmost position, to pass from loading from the magazine to single loading it is necessary to force the top cartridge or follower below the reach of the bolt, to push the bolt slightly forward and to turn the cut-off down, showing "off."

In case of a misfire it is unsafe to draw back the bolt immediately, as it may be a case of hang-fire. In such cases the piece should be cocked by drawing back the cocking piece.

It is essential for the proper working and preservation of all cams that they be kept lubricated.

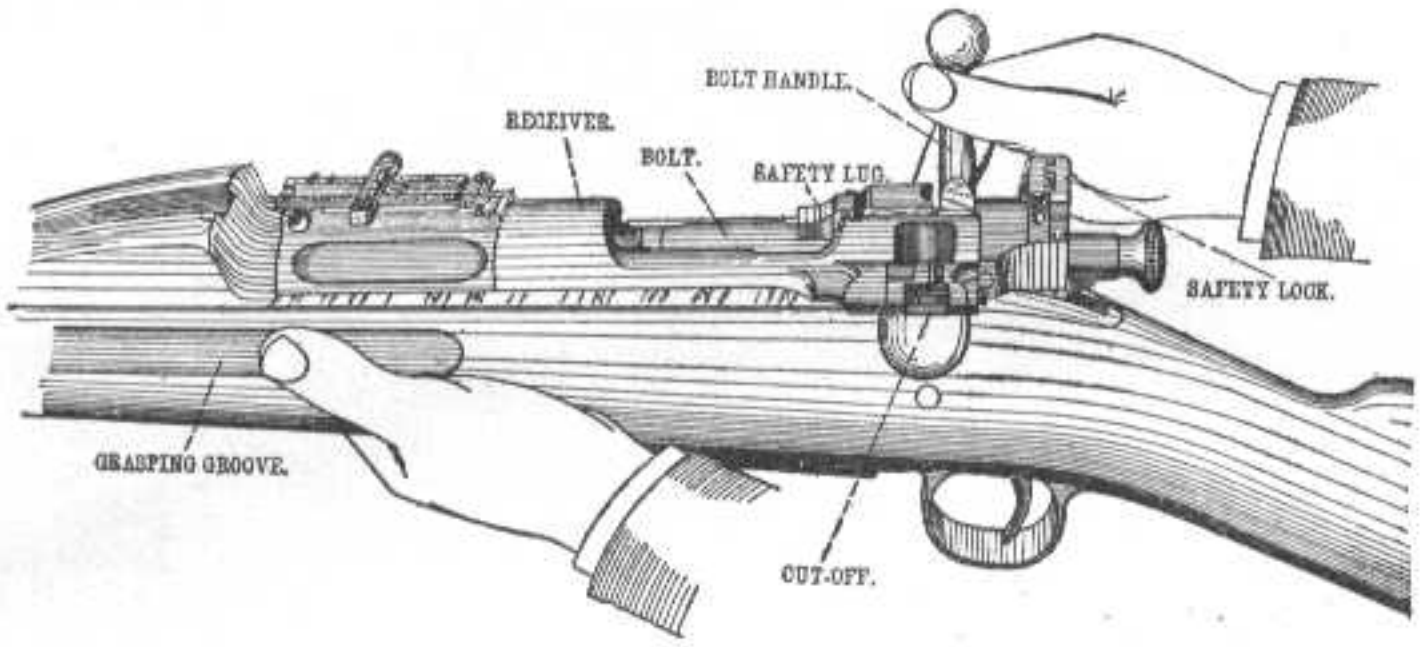
DISMOUNTING AND ASSEMBLING BY SOLDIER.

The bolt and magazine mechanism can be dismounted without removing the stock. The latter should never be done, except for making repairs, and then only by some selected and instructed man.

TO DISMOUNT BOLT MECHANISM.

Place the cut-off at the center notch; cock the arm and turn the safety lock to a vertical position, raise the bolt handle and draw out the bolt. (Fig. 144.)

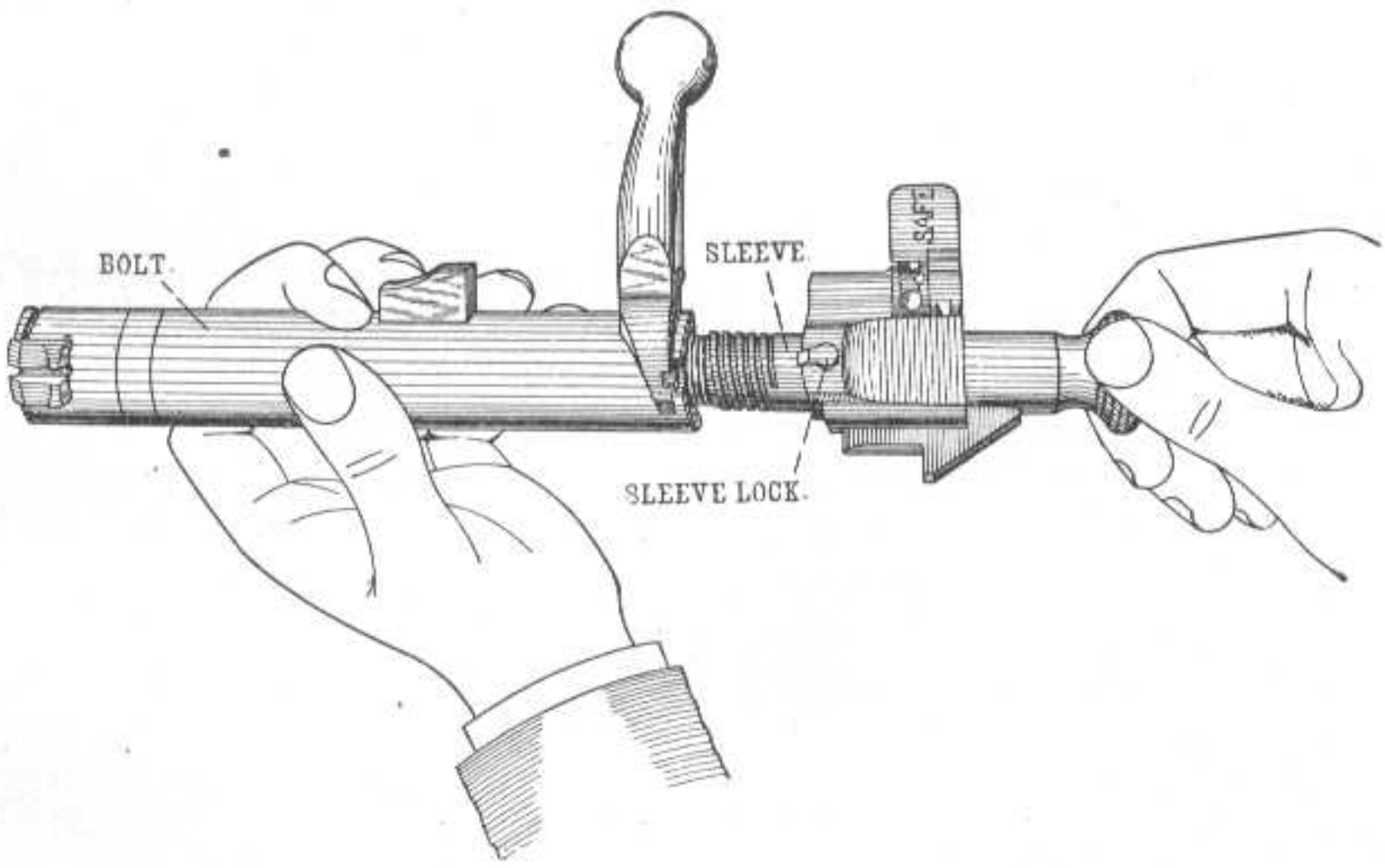
Fig. 144.



Hold bolt in left hand, press sleeve lock in with thumb of right hand to unlock sleeve from bolt, and unscrew sleeve by turning to the left. (Fig. 145.)

Hold sleeve between forefinger and thumb of the left hand, draw cocking piece back with middle finger and thumb of right hand, turn

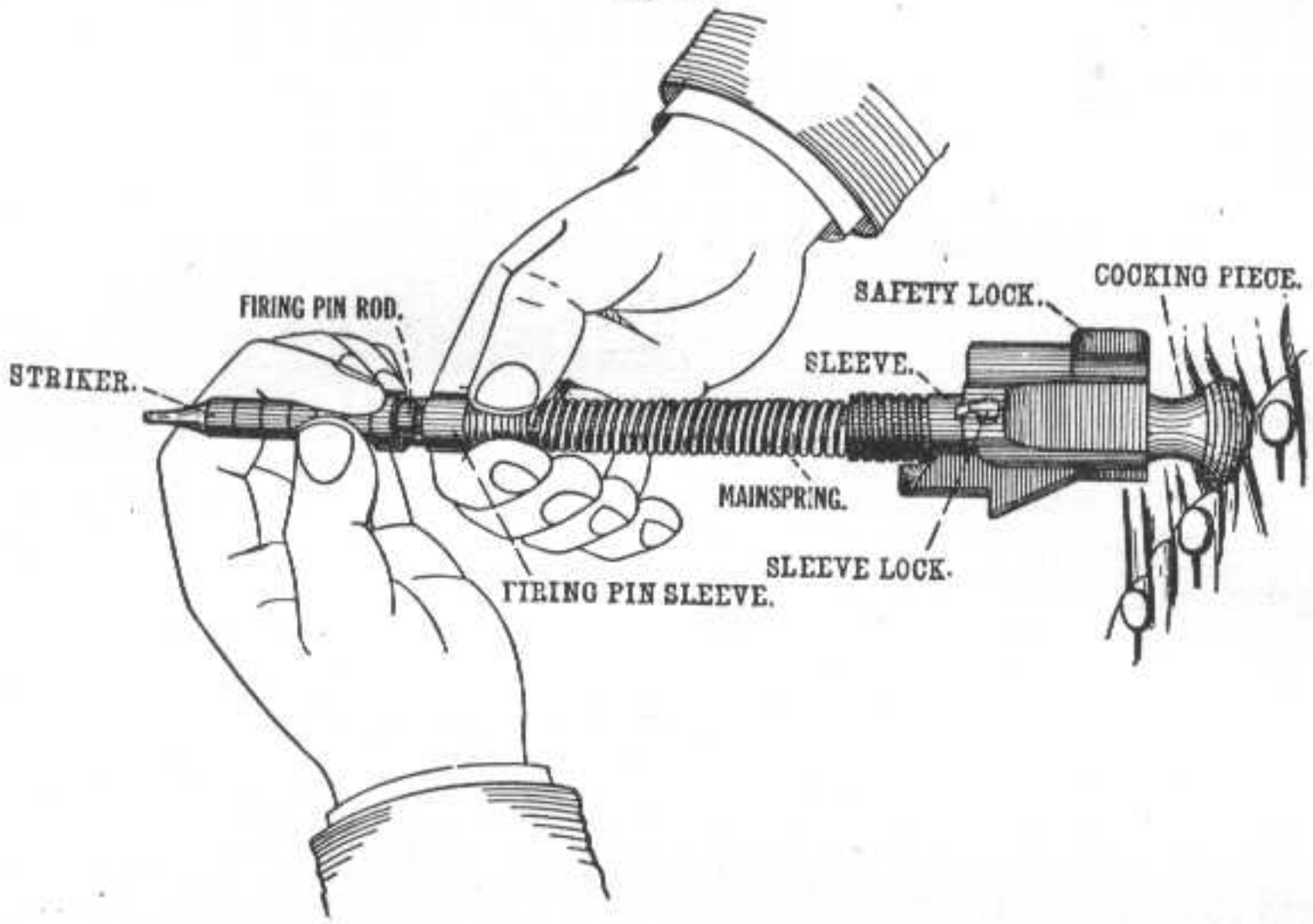
Fig. 145.



safety lock down to the left with the forefinger of the right hand, in order to allow the cocking piece to move forward in sleeve, thus partially relieving the tension of mainspring; with the cocking piece against the breast, draw back the firing pin sleeve with the forefinger

and thumb of right hand and hold it in this position (Fig. 146) while removing the striker with the left hand; remove firing pin sleeve and mainspring; pull firing pin out of sleeve; turn the extractor to the

Fig. 146.

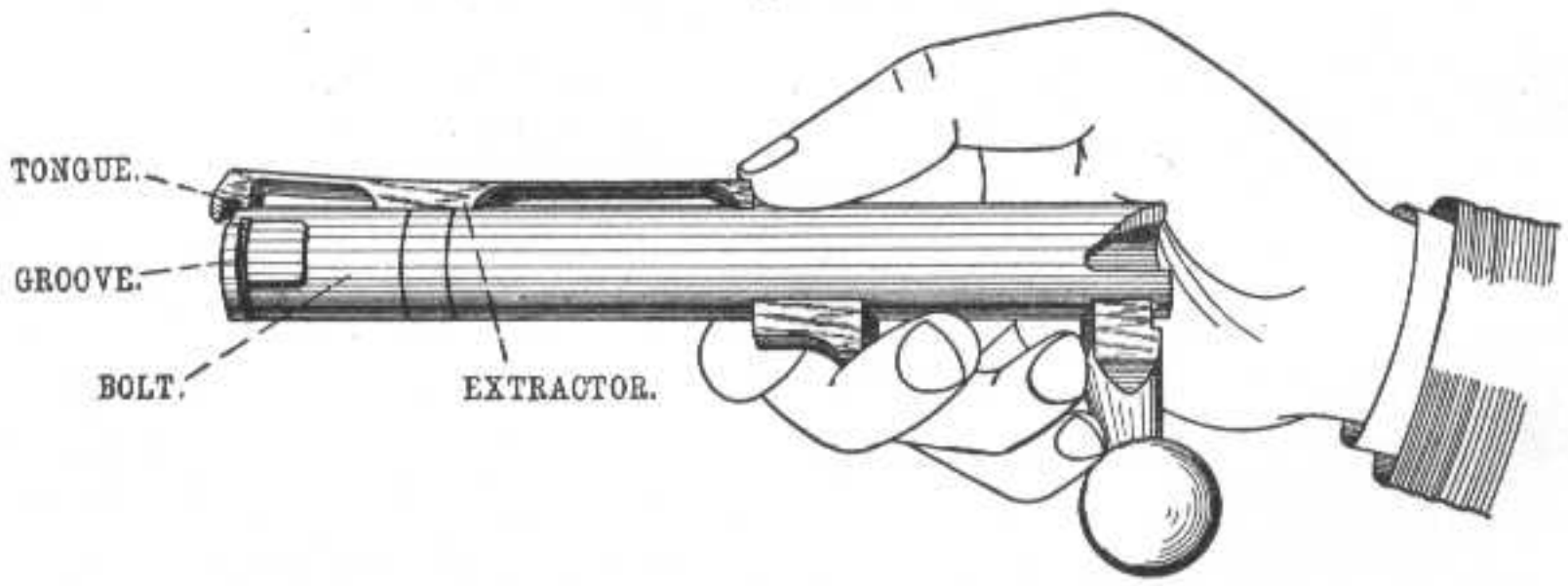


right, forcing its tongue out of its groove in the front of the bolt, and force the extractor forward (Fig. 147) and off the bolt.

TO ASSEMBLE BOLT MECHANISM.

Grasp with the left hand the rear of the bolt, handle up, and turn the extractor collar with the thumb and forefinger of the right hand until its lug is on a line with the safety lug on the bolt; take the extractor in the right hand and insert the lug on the collar in the

Fig. 147.



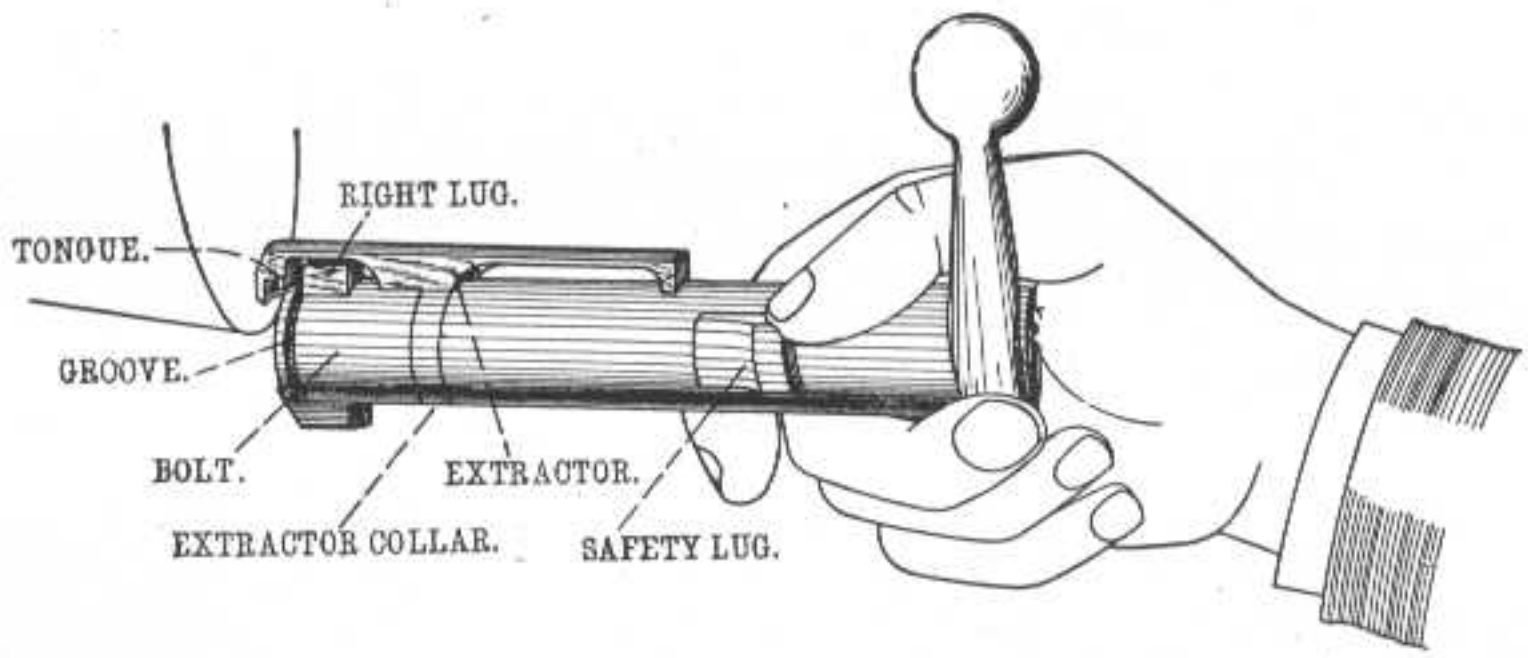
undercuts in the extractor by pushing the extractor to the rear until its tongue comes in contact with the rim on the face of the bolt (a slight pressure with the left thumb on the top of the rear part of the extractor assists in this operation); turn the extractor to the right until it is over the right lug; take the bolt in the right hand and press

the hook of the extractor against the butt plate (Fig. 148) or some rigid object, until the tongue on the extractor enters its groove in the bolt.

With the safety lock turned down to the left to permit the firing pin to enter the sleeve as far as possible, assemble the sleeve and firing pin; place the cocking piece against the breast and put on mainspring, firing pin sleeve, and striker (see Fig. 146). Hold the cocking piece between the thumb and forefinger of the left hand, and by pressing the striker point against some substance, not hard enough to injure it, force the cocking piece back until the safety lock can be turned to the vertical position with the right hand; insert the firing pin in the bolt and screw up the sleeve (by turning it to the right) until the sleeve lock enters its notch on the bolt.

See that the cut-off is at the center notch; hold the piece under floor plate in the fingers of the left hand, the thumb extending over the left side of the receiver; take bolt in right hand with safety lock in a ver-

Fig. 148.



tical position and safety lug up; press rear end of follower down with left thumb and push bolt into the receiver; lower bolt handle; turn safety lock and cut-off down to the left with right hand.

TO DISMOUNT MAGAZINE MECHANISM.

With the bullet end of a cartridge press on the floor plate catch (through the hole in the floor plate), at the same time drawing the bullet to the rear; this releases the floor plate.

Raise the rear end of the first limb of the magazine spring high enough to clear the lug on the floor plate and draw it out of its mortise; proceed in the same manner to remove the follower.

To assemble magazine spring and follower to floor plate, reverse operation of dismounting.

Insert the follower and magazine spring in the magazine, place the tenon on the front end of the floor plate in its recess in the magazine, then place the lug on the rear end of the floor plate in its slot in the guard, and press the rear end of the floor plate forward and inward at the same time, forcing the floor plate into its seat in the guard.

TO COMPLETE DISMOUNTING.

(Not to be done by soldier.)

The bolt and magazine mechanism having been dismounted, proceed as follows:

1. Turn safety lock to dismounting bevel on sleeve and remove it by striking the thumb piece a light blow.

2. To dismount the sleeve lock, drive out sleeve lock pin from the top and remove lock and spring, being careful not to lose the spring.

3. Remove front sight pin (see directions for replacing broken parts, p. 44) and remove front sight.

4. Press in rear end of lower band spring and drive forward the lower band by a few sharp blows on the lug and then on top with a hardwood block.

5. Remove upper band screw and drive upper band forward, in the same manner prescribed for the lower band.

6. Move upper band forward on barrel until stopped by movable stud, and then remove lower band by slipping it over upper band and movable stud. To remove upper band entirely from barrel requires the removal of the front sight screw and the movable stud.

7. Draw hand guard forward until free from the fixed base and remove.

8. Remove guard screws and guard. It may be necessary to tap gently on the front and rear of the guard bow to loosen.

9. Remove barrel and receiver from stock.

10. To remove the lower band spring, drive its spindle out of its hole in the stock from the left.

11. Unscrew the butt swivel screws and remove the butt swivel plate from stock. The butt swivel, consisting of the plate, swivel, and pin, permanently assembled, is issued complete.

12. Unscrew butt plate screws and remove butt plate from stock.

13. Unscrew butt plate spring screw and remove the butt plate spring; drive out butt plate pin (see direction on p. 44) and remove butt plate cap.

14. Remove cut-off by loosening the screw in the end of the thumb piece until it disengages the groove in the cut-off spindle; insert the blade of a screw-driver in the notch in the rear end of the spindle and force it out. Remove the spring and the plunger, being careful not to lose them.

15. Remove the ejector by driving out the ejector pin from the upper side.

16. Remove sear and trigger by driving out the sear pin from the right, being careful not to lose the sear spring.

17. Remove trigger from sear by driving out the trigger pin from either side.

18. Remove floor plate catch and spring by driving out the pin from either side.

19. Remove bolt stop by inserting a small punch or end of striker in the hole in the left end and forcing it from its pocket.

The leaf should never be removed from the movable base except for the purpose of making repairs.

The fixed base and the fixed stud should never be removed from the barrel.

The barrel should never be unscrewed from the receiver.

TO ASSEMBLE AFTER DISMOUNTING.

Reverse and follow in inverse order the operations of dismounting.

In assembling the sleeve lock to the sleeve, be careful to compress the lock and spring while driving in the pin from the bottom of the sleeve.

To assemble the safety lock and sleeve, insert the safety lock spindle in its hole in the sleeve as far as it will go; then, with the thumb piece vertical and pressed against some rigid object, introduce the point of the tool provided for this purpose between the safety lock spindle and the safety lock plunger, forcing the latter into the thumb piece until it slips over the edge of the sleeve. Further pressure on the safety lock thumb piece, together with the gradual withdrawal of the tool, will complete the assembling.

In assembling pins and screws, note directions for replacing broken parts on page 44.

The floor plate spring and the cut-off spring are alike, except in length. The latter being the longer, care should be taken not to substitute one for the other.

CARE OF THE RIFLE.

As the bore of the rifle is manufactured with great care in order that a high degree of accuracy may be obtained, it should be carefully cared for. The residuum from smokeless powder tends to corrode the bore and should therefore be removed as soon after firing as practicable. The following method has been practiced at the Springfield Armory for a number of years with good results: Using the cleaning rod and small patches of cloth (preferably canton flannel), clean the bore thoroughly with patches soaked in a saturated solution of soda and water. Then thoroughly dry the bore and remove the soda solution by the use of dry patches, and finally oil the bore with patches soaked in cosmic oil. Twenty-four hours after this first

cleaning the bore should be again cleaned as described above, as it has been found that the powder gases are probably forced into the texture of the steel and will, if the second cleaning is not resorted to, cause rusting, no matter how thoroughly the bore may have been cleaned at first.

If, however, a cleaning rod is not at hand, the barrel should be cleaned as thoroughly as possible by means of the thong brush and rags, and oiled as above. To clean or oil the bore with rags, the thong brush is unscrewed, the rag placed in the rag slot of the thong tip and drawn from the muzzle toward the breech.

If gas escapes at the base of the cartridge, it will probably enter the well of the bolt through the striker hole. In this case the bolt mechanism must be dismounted and the parts and well of the bolt thoroughly cleaned.

Before assembling the bolt mechanism, the firing pin, the barrel of the sleeve, the body of striker, the well of bolt, and all cams should be lightly oiled.

Many of the parts can generally be cleaned with dry rags. All parts after cleaning should be wiped with an oiled rag.

The best method of applying oil is to rub with a piece of cotton cloth upon which a few drops of oil have been placed, thereby avoiding the use of an unnecessary amount of oil; this method will, even in the absence of the oiler, serve for the cams and bearings, which should be kept continually oiled.

Any part that may appear to move hard can generally be freed by the use of a little oil.

The stock and hand guard may be coated with raw linseed oil and polished by rubbing with the hand.

Sperm oil should only be used for lubricating metallic bearing and contact surfaces.

For the chamber and bore, only cosmoline or cosmic should be used. This should also be applied to all metallic surfaces, to prevent rusting when arms are stored or when not used for an appreciable length of time.

METALLIC FOULING.

It has been found that a deposit of metallic fouling is left in the bore of the rifle when ball cartridges, caliber .30, model of 1906, of earlier manufacture, are used, and a solution for the removal of metallic fouling from the bores of small arms has, therefore, been issued by the Ordnance Department to all post ordnance officers for reissue to organizations.

It consists of 1 ounce of ammonium per-sulphate, 200 grains ammonium carbonate, 6 ounces ammonia (28 per centum), and 4 ounces water, making a sufficient quantity to clean 20 rifles. If no

scales are available for weighing the ingredients, they may be measured, and the equivalents are as follows:

1 ounce of ammonium per-sulphate equals two medium heaping spoonfuls.

200 grains ammonium carbonate equals one medium heaping spoonful.

6 ounces ammonia, 28 per centum pure, equals three-eighths of a pint.

4 ounces water equals one-fourth of a pint.

The spoon referred to above is the spoon issued by the Ordnance Department for the mess outfit.

The solution is made as follows:

The carbonate and per-sulphate should first be pulverized and mixed together and the ammonia and water added, after which the mixture should be thoroughly stirred. The solution should stand for half an hour before using. The bore of the rifle should be plugged with a cork or wooden plug at the breech end and just below the metallic fouling. The bore should then be filled with the solution and the muzzle corked or plugged. The solution should remain in the bore for about two hours or long enough to cut the metallic fouling, after which it should be removed and canton flannel or other soft material run back and forth through the bore to remove the residue. Great care must be taken to remove the solution from all metallic parts, as it may start rusting in a very short time. Special care should be used in removing it from the breech mechanism. The solution may be used several times, but after it has been once used it should be placed in a bottle and not mixed with any unused solution. This solvent is expensive and should be used economically.

PACKING OF RIFLE.

The rifles are issued in arm chests containing:

10 United States rifles, caliber .30, model of 1903.

2 drift slides, No. 4.

2 drift slides, No. 6.

10 front sight covers.

5 oiler and thong cases.

5 thongs and thong brushes.

5 spare part containers with contents.

1 cleaning rod, model of 1910, and cleaning-rod case.

2 screw-drivers.

1 book, Description and Rules for the Managenent of the United States Rifle, Caliber .30, Model of 1903, Form 1923.

The interior of the arm chest is provided with wooden packing strips for the purpose of securely holding the rifles in place in transportation. The arrangement of this packing and of the rifles should

be carefully observed when arms are received from an arsenal, in order that the same method may be used if for any reason the rifles should be shipped away from the post. Rifles should never be shipped in these chests unless all of the packing strips have been properly assembled with the rifles in the chests.

The ends of these chests are provided with narrow pockets for the reception of the front sight covers, screw-drivers, extra drift slides, and descriptive pamphlet which are shipped with the rifles.

Plate II, at the back of this pamphlet, shows the arm chest in detail.

ARM LOCKER FOR UNITED STATES RIFLE, CALIBER .30, MODEL OF 1903.

This chest is issued at the rate of one per company or troop for use in the safe-keeping of the surplus rifles of a company or troop. It is provided with reenforcing angle irons which secure the bottom of the chest to the sides; and with blind strap hinges, hasps, and staples for securing the cover to the body of the chest. Two padlocks with chains and keys are also issued with each arm locker.

Plate III, at the back of this pamphlet, shows the arm locker in detail.

REPAIR OF RIFLE.

The following spare parts will be issued for repairs of arms in the hands of troops:

RIFLE.

Bolt:
- Bolt. } Assembled.
- Extractor collar. }

Bolt Stop:
- Bolt Stop Pin. } Assembled.
- Bolt Stop Spring. }

Butt Plate.
Butt Plate Cap.
Butt Plate Pin.
Butt Plate Screw, Large.
Butt Plate Screw, Small.
Butt Plate Spring.
Butt Plate Spring Screw.
Butt Swivel:
- Butt Swivel. } Assembled.
- Butt Swivel Pin. }
- Butt Swivel Plate. }

Butt Swivel Screw.
Cut-off.
Cut-off Plunger.
Cut-off Screw.
Cut-off Spindle.
Cut-off Spring.
Ejector.
Ejector Pin.
Extractor.
Firing Pin:
- Cocking Piece. } Assembled.
- Firing Pin Rod. }

Firing Pin Sleeve.
Floor Plate.
Floor Plate Catch.
Floor Plate Pin.
Floor Plate Spring.
Follower.
Front Sight.
Front Sight Pin.
Guard.
Guard Screw Bushing.
Guard Screw, Front.
Guard Screw, Rear.
Hand Guard.
Hand Guard Clip.
Lower Band.
Lower Band Screw.
Lower Band Spring.

- Lower Band Swivel.
- Magazine Spring.
- Mainspring.
- Rear Sight:
  - Base Spring.
  - Drift Slide No. 5— (Assembled.)
    - Drift Slide, .05 Peep.
    - Drift Slide Pin.
  - Joint Pin.
  - Leaf.
  - Movable base.
  - Slide: (Assembled.)
    - Slide.
    - Slide Cap.
  - Slide Binding Screw.
  - Slide Cap Pin.
  - Slide Cap Screw.
  - Windage Screw— (Assembled.)
    - Windage Screw
    - Windage Screw Collar.
    - Windage Screw Knob.
    - Windage Screw Pin.
    - Windage Screw Spring.

APPENDAGES.

- Drift Slide No. 4: (Assembled.)
  - Drift Slide, .04 Peep.
  - Drift Slide Pin.
- Drift Slide No. 6: (Assembled.)
  - Drift Slide, .06 Peep.
  - Drift Slide Pin.
- Front Sight Cover.
- Oiler and Thong Case:
  - Oil Dropper.
  - Oiler Cap Washer.
  - Thong Case Body— (Assembled.)
    - Oiler Collar.
    - Thong Case Body.
    - Thong Case Partition.
- Safety Lock: (Assembled.)
  - Safety Lock Plunger
  - Safety Lock Spindle.
  - Safety Lock Spring.
  - Safety Lock Thumb Piece.
- Sear.
- Sear Pin.
- Sear Spring.
- Sleeve:
  - Sleeve. (Assembled or separately.)
  - Sleeve Lock.
  - Sleeve Lock Pin
  - Sleeve Lock Spring.
- Stacking Swivel.
- Stacking Swivel Screw.
- Stock: (Assembled.)
  - Guard Screw Bushing.
  - Stock.
  - Stock Screw.
  - Stock Screw Nut.
- Striker.
- Trigger.
- Trigger Pin.
- Upper Band.
- Upper Band Screw.
- Oiler and Thong Case—Contd.
  - Thong Case Cap— (Assembled.)
    - Thong Case Cap.
    - Thong Case Pad.
- Thong:
  - Thong Cord.
  - Thong Tip.
  - Thong Weight.
- Thong Brush.
- Spare Part Container (wood part).

ACCESSORIES.

- Cleaning Rod, Model of 1910:
  - Brush Section.
  - Handle Section—
    - Handle Section. } Assembled.
    - Knob. } Assembled.
    - Knob Pin. } Assembled.
  - Patch Section.
  - Second Section.
- Cleaning Rod Model of 1910—Continued.
  - Swivel Section—
    - Swivel. } Assembled.
    - Swivel Screw. } Assembled.
    - Swivel Section. } Assembled.
  - Cleaning Rod Case.
  - Screw-Driver.

BAYONET, MODEL OF 1905.

- Bayonet, complete.
- Bayonet Catch.
- Bayonet Grip, Left.
- Bayonet Grip, Right.
- Bayonet Nut.
- Bayonet Scabbard Catch.
- Bayonet Screw.
- Bayonet Spring.
- Bayonet Washer.

ARTIFICER'S CHEST, MODEL OF 1910.

In place of the company repair kit formerly issued, the artificer's chest has been adopted for future issue. This chest will be issued to each organization armed with the rifle, and to each regimental or post ordnance officer for cleaning, repairing, and preserving arms and equipments. The chest contains the following tools, cleaning material, and spare parts:

TOOLS.

- 1 Anvil.
- 1 Bullet jacket extractor.
- 10 Drifts for the following pins and springs—
  - No. 1. Assembling and dismounting base spring.
  - No. 2. Removing trigger and butt plate pins.
  - No. 3. Starting front sight and sleeve lock pins.
  - No. 4. Drawing out pins started with No. 3.
  - No. 5. Removing joint, sear, and ejector pins.
  - No. 6. Starting floor plate pin and removing bolt stop.
  - No. 7. Driving out floor plate pin and lower band spring.
  - No. 8. Starting windage screw pin and slide cap pin (2).
  - No. 9. Removing pins started with No. 8.
- 1 Eyelet awl, for putting eyelets in belt.
- 1 Eyelet set.
- 3 Files, 6 inch; flat, round, and three-square.
- 1 Hammer, steel.
- 1 Hammer, brass.
- 1 Handle, tool, containing 10 tools.

1 Oiler, with cap.
2 Pliers, flat and round nose.
1 Saw, detachable handle.
2 Screw drivers, fitting the following screws—
No. 1. Guard, large butt plate and butt plate spring screws.
No. 2. Stacking swivel, lower band, butt swivel, small butt plate, upper band, and bayonet screws.
1 Set No. 1, for upsetting ends of the lower band and stacking swivel screws.
1 Tool for assembling safety lock on sleeve.
1 Vise, 1.25 pound.

SPARE PARTS (REVOLVER).

3 Cylinder bolt springs.
9 Hammer strut springs.
10 Hand springs.
2 Hands and springs, assembled.

CLEANING MATERIAL.

2 Pints cosmic.
3 Pints sperm oil.
250 Cut patches (cotton flannel).
250 Cut patches (Tampa flannel).

SPARE PARTS (RIFLE).

2 Bolts with extractor collar, assembled.
7 Cocking pieces and firing pin rods, assembled.
2 Cut-off plungers.
2 Cut-off springs.
2 Ejector pins.
4 Extractors.
5 Front sight covers.
2 Lower band screws.
2 Mainsprings.
1 Safety lock, complete.
2 Slide binding screws.
4 Slide cap pins.
3 Slides and slide caps, assembled.
1 Stacking swivel.
2 Stacking swivel screws.
15 Strikers.

FOR SHOES.

2 Quarts neat's-foot oil.

FOR BELTS

50 Eyelets.
50 Washers for eyelets.

The tools named above must be handled carefully and with skill to avoid injuring the heads and threads of screws and defacing other metallic parts.

PARTS WHICH ARE MOST LIABLE TO REQUIRE REPAIR.

BOLT STOP.—Worn by continual contact with bolt.

COCKING PIECE.—Nose worn from neglect to keep it lubricated.

LOWER BAND SWIVEL AND SCREW.—Screw, if not riveted in place, works loose and, with swivel, is lost.

SAFETY LOCK.—Thumb piece knocked off by blow.

STACKING SWIVEL AND SCREW.—Screw, if not riveted, works loose and, with swivel, is lost.

STOCK.—Bruises, cuts, pieces chipped from different points, broken at small.

STRIKER.—Point burned by defective cartridge, or broken by snapping on empty chamber.

REPLACING BROKEN PARTS.

BUTT PLATE PIN.—This pin has both ends upset; the burr on one end must be filed off and the pin driven out with a drift; when a new pin is put in its ends must be upset with light blows of a hammer.

FRONT SIGHT.—The burr on the left side must be filed off and the pin driven out from the left with a drift; when the new front sight is in place, a new pin is driven in from the right and its left end upset with light blows of a hammer.

LOWER BAND SCREW.—This screw, when in place, has its end upset and riveted over the band ear. It should never work loose, if properly assembled, and when it has to be removed to replace an injured swivel, the burr on the end should be filed off and the screw taken out, the end being again upset when the screw has been returned to its place.

STACKING SWIVEL SCREW.—As the screw is made long and its end upset, it should be kept well screwed up at all times. It is removed to replace a broken swivel and replaced as explained in preceding paragraph, care being taken to upset the *end* only.

TRIGGER PIN.—This is a straight pin and can be driven in or out from either side.

INJURIES WHICH DO NOT RENDER PARTS UNSERVICEABLE.

BOLT.—The entire flange at front end may be broken off, except a small portion on the opposite side from the extractor hook, which is required to hold, in connection with the extractor hook, the empty case while it is being drawn to the rear for ejection.

If automatic ejection be not considered, the entire flange may be dispensed with.

BUTT PLATE.—Bruises, cuts, or wearing.

BUTT SWIVEL.—Bent.

COCKING PIECE.—Moderate wearing of nose. The nose can wear until raising and lowering the bolt handle fails to cock the piece.

EXTRACTOR.—Moderate wear or break of edge of hook.

FLOOR PLATE.—Bent or bruised.

GUARD.—Bent, bruised, or cut.

USING THE RIFLE WHEN CERTAIN PARTS OF THE BOLT AND MAGAZINE MECHANISM ARE WANTING.

The parts not essential, or only so to a degree, are the ejector, safety lock, cut-off, bolt stop, sleeve lock, floor plate, magazine spring and follower.

In the absence of the ejector, the empty cases drawn to the rear by the extractor can be removed from the receiver by the finger.

The safety lock being merely a precautionary device, its absence does not affect the usefulness of the arm.

In the absence of the cut-off, the arm can be loaded from the magazine, but the magazine can not be held full in reserve; in single loading with the cut-off wanting and magazine empty, the soldier should be instructed to load directly into the magazine, as otherwise the forward motion of the bolt will be stopped by coming in contact with the follower. In this case, care should be taken in drawing the bolt back not to draw it from the receiver.

The absence of the bolt stop and sleeve lock does not affect the usefulness of the arm.

The absence of the floor plate, follower, and magazine spring only prevents the use of the magazine, but does not prohibit the use of the arm as a single-loader. The soldier should be taught to appreciate these facts.

REMARKS.

Complaints have not infrequently been received that a mainspring was too weak to perform its office, when the fault rested with the soldier, who in sighting inadvertently raised the bolt handle with his hand before pulling the trigger, and thus caused the force of the spring to be expended in closing the bolt, instead of in exploding the cartridge.

All cams and bearings should be kept slightly oiled to prevent wear.

When firing many successive rounds care must be taken that unburned grains of powder do not collect and pack in the locking lug recesses of the receiver, as this will interfere with the perfect closing of the bolt. Such accumulations can be blown out from time to time, or, when packed, removed by a knife or the screw-driver.

Except when repairs are needed, the following parts will constantly be injured if allowed to be dismounted by the soldier for cleaning; and when repairs are necessary, they should be removed only by a company artificer, or some one familiar with the handling of tools and delicate mechanisms, viz: Bolt stop, cut-off, safety lock, sleeve lock, front sight, movable stud, lower band, upper band, and stacking swivel screws.

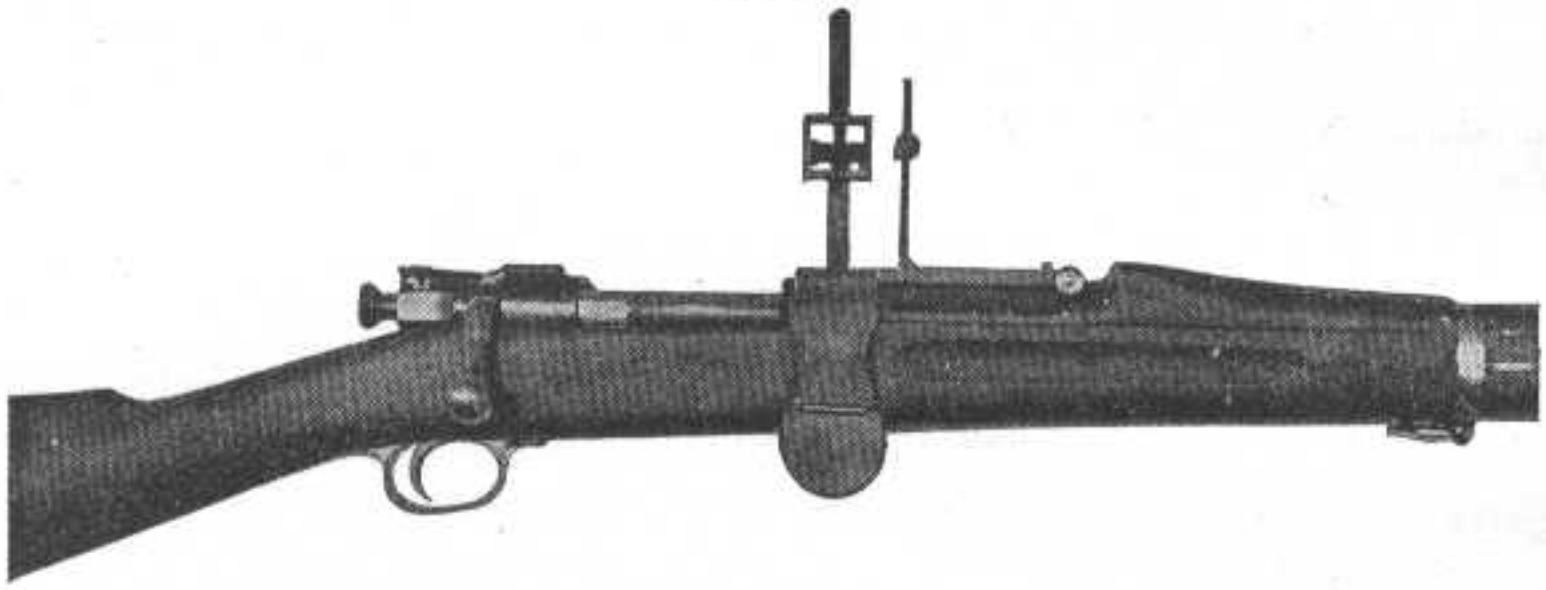
Unless the screw-driver is handled carefully, and with some skill, the screws are sure to be injured either at the head or thread.

The BULLET JACKET EXTRACTOR is shown in Figs. 149, 150, and 151. This extractor consists of a steel cylindrical plug provided with lands and grooves on the sides. To use the extractor, it is inserted in the muzzle of the barrel hollow end (see Fig. 149) first. The extractor is then urged down the barrel by pressure applied with the cleaning rod until the jacket and extractor fall out into the chamber. (See artificer's chest, model of 1910, page 42.)

Fig. 149. Fig. 150. Fig. 151.

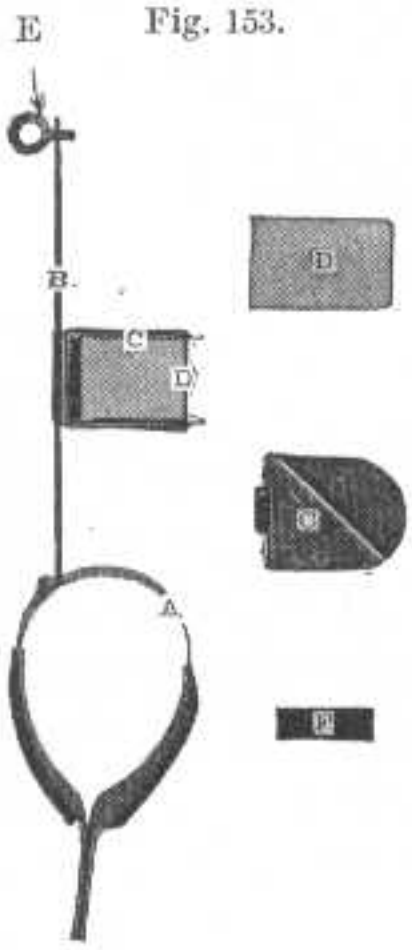
The AIMING DEVICE, Fig. 152, in place on the arm, and Fig. 153, in detail, is intended for use in aiming drill, and is issued to infantry,

Fig. 152.



cavalry, and engineers at the rate of four per company. By it the instructor, while standing on one side and facing the rear sight on the rifle when the soldier is in the act of aiming, can see the reflection of both sights and the object aimed at and can therefore judge of the accuracy and steadiness of the soldier's aim.

E Fig. 153.



The device consists of a circular spring steel *clip* A, which embraces the barrel and a portion of the stock immediately in rear of the rear sight, a *standard* B, riveted to the clip, and a sheet-steel *cage* C, mounted on the standard, which carries a glass *reflector* D.

The ends of the spring clip are covered with leather to prevent marring of the barrel and stock. This leather cover terminates in two loose flaps, by which the clip can be spread in seating and removing the device.

The upper end of the standard is drilled and tapped for a *screw eye* E, which prevents accidental removal of the reflector cage.

The reflector cage consists of a back and a top and bottom. To the back is riveted a piece of sheet steel, shaped to engage the standard forming a sliding bearing for the cage on the standard. A flat leaf *spring* F, secured in this

bearing, gives sufficient friction on the standard to hold the cage at the desired height. The top and bottom of the cage contain grooves, set at an angle of 45° with the barrel, in which is seated the reflector glass. The glass itself is plain sheet glass slightly smoked, with its edges rounded. The cage, standard, and clip are blued to prevent glaring reflection from sunlight, and in the case of the cage to furnish a mirror back for the glass.

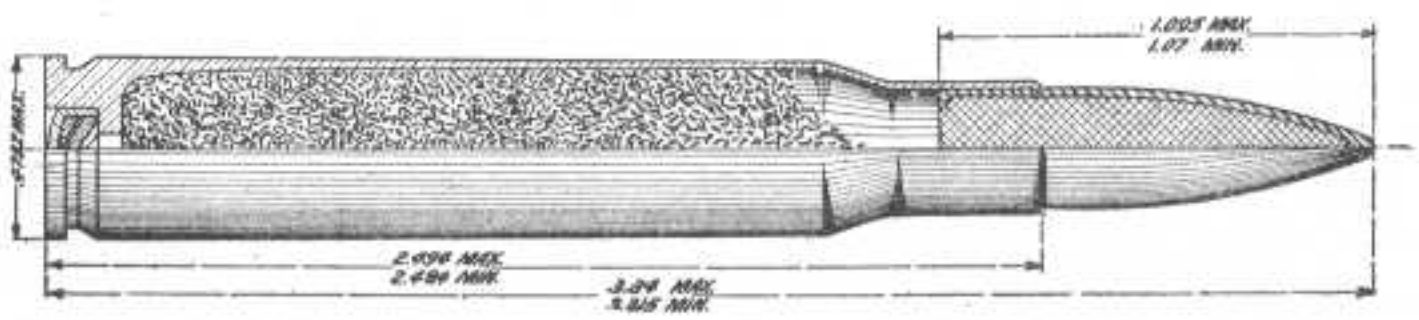
To use the aiming device, it should be seated firmly on the gun just in rear of the rear sight, taking care that the standard is vertical. The exposed edge of the reflector glass must always be to the rear in order to obtain a reflection of the sights. If the instructor desires to stand upon the soldier's right, the device must be placed on the gun so that the standard is on the left; if on the other side, the standard must be on the right side of the gun. In changing from one side to the other it is necessary to slip the cage off the standard and reverse it. The cage can be raised or lowered on the standard to suit the elevation used on the rear sight.

AMMUNITION FOR UNITED STATES RIFLE, CALIBER .30, MODEL OF 1903.

BALL CARTRIDGE, MODEL OF 1906.

The CALIBER .30 BALL CARTRIDGE, Fig. 154, consists of the *case*, *primer*, *charge of smokeless powder*, and *bullet*. The case is of cartridge brass. It has a conical body joined by a sharper cone, called the shoulder, to the neck, which is the seat of the bullet and very nearly cylindrical. The front end of the case is called the mouth and the rear end the head. The mouth edge of the case is crimped on the bullet, when the cartridge is assembled, in order to keep the bullet secure in the case. The head of case is grooved to provide for extraction of cartridge from the chamber of the rifle and is provided with a primer pocket and vent. The initials of the place of manufacture, the number of the month, and the year of its fabrication are stamped on the head of case.

FIG. 154.



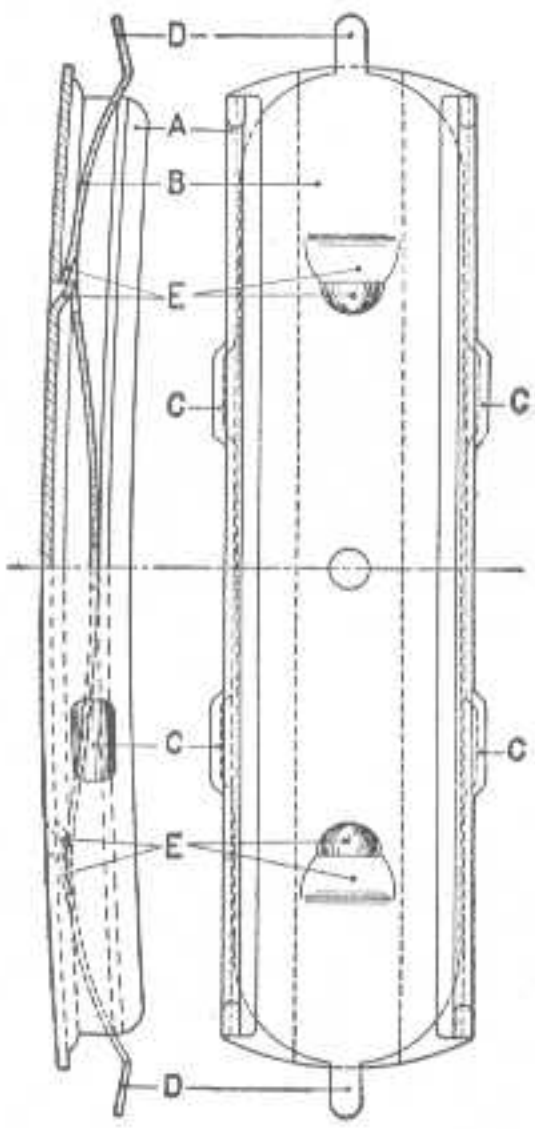
The primer consists of the *cup*, *percussion composition*, *disk of shellacked paper*, and *anvil*. The cup is of gilding metal and contains 0.46 grain of nonfulminate composition composed of tersulphide of antimony, potassium chlorate, and sulphur. A disk of shellacked paper covers the composition to protect it from moisture and to

prevent electrolytic action. The anvil is of brass and is assembled over the paper. After the primer is assembled to the case a drop of shellac is placed on the head of the primer to make the joint waterproof.

The charge is of pyrocellulose composition very similar to the powders used as propelling charges in field and seacoast guns. The grains are cylindrical, single, perforated, and graphited. The normal charge weighs from 47 to 50 grains, varying with the lot of powder used.

The bullet has a core of lead and tin composition inclosed in a jacket of cupro nickel. It weighs 150 grains, and the point is much sharper and offers less resistance to the air than that of any previous model in the United States service. The bullet is cannelured to receive the crimp of the case, and the base of the bullet is flat. The neck of the case is shellacked before loading, and a pressure of at least 75 pounds is required to seat the bullet in the case; this, with the addition of the above-mentioned crimp, makes the case waterproof.

FIG. 155.



The standard muzzle velocity of this ammunition in the rifle is 2,700 feet per second. The instrumental velocity measured at 78 feet from the muzzle is 2,640 feet per second, with an allowed mean variation of 20 feet per second on either side of the standard.

The cartridge complete weighs about 395.5 grains, its weight varying slightly with variation in the weight of the powder charge.

Five cartridges are packed in a clip.

The CLIP, Fig. 155, consists of the *body* A and the *spring* B, both of brass. On the exterior of the sides of the body are the *stop lugs* C, which seat the clip in its slots in the receiver of the rifle. The top edges of the slides are folded inward, forming flanges, which, fitting into the grooves in the heads, hold the cartridges in place. The spring is secured to the bottom of the body by two sets of *interlocking lips* E. The spring is provided with narrow *tongues* D, which, when the clip is filled, are pressed into the grooves of the outside cartridges, holding the cartridges securely in the clip. The clip body can be used a number of times, but the springs only once.

The gallery practice and dummy clip is provided with a strong bronze spring without tongues.

Sixty ball cartridges in 12 clips are packed in a bandoleer.

The bandoleer is made of olive-drab cloth and contains six pockets, each holding two clips. The clips can be readily taken out by forcing back the fold of the pocket.

The bandoleer is provided with a shoulder strap of olive-drab webbing by which it is carried over the shoulder, and a safety pin is provided to afford an adjustment of its length to suit the convenience of the soldier. When packed the bandoleer weighs about 3.88 pounds.

In each bandoleer is placed an identification card showing the number of cartridges, the caliber and model of ammunition and rifle, place and date of manufacture, kind and lot of powder, and muzzle velocity. The shop symbols of loaders, inspectors, and packers are also given. In case of defective ammunition this card should be returned with report.

Twelve hundred cartridges are packed in a zinc-lined packing box, hermetically sealed. Each box contains 20 bandoleers of 60 cartridges each. The packing box measures 34.5 by 9.5 by 8.27 inches and weighs about 99 pounds.

The lid is held to the box by five brass bolts, and can be easily removed without the use of tools. Two wire seals connect the cover with the sides of the box.

When the lid is removed the zinc lining may be torn open by means of a brass handle on the tin cover.

A new metal packing chest has been adopted. It is made of tinned sheet iron painted olive drab. This chest holds 1,200 cartridges packed in 20 bandoleers of 60 cartridges each. It has a tin cover under the lid and is hermetically sealed.

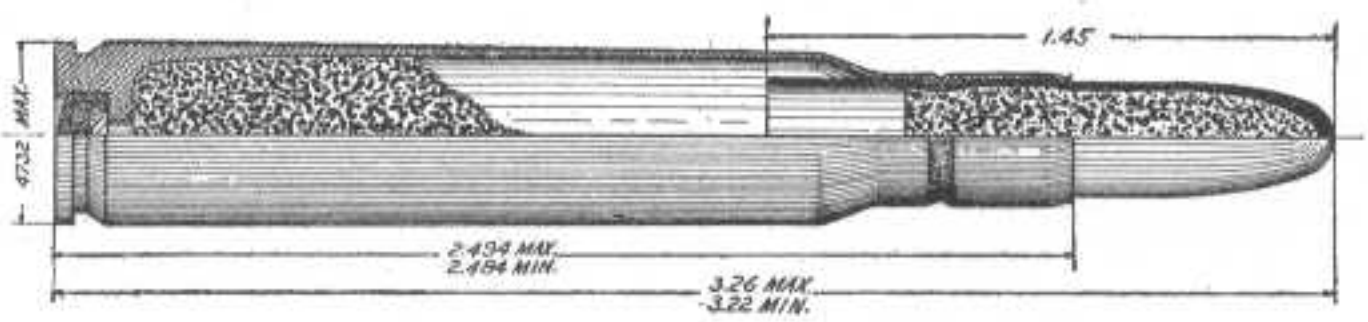
The chest measures 8 by $16\frac{1}{4}$ by 14 inches and weighs about 95 pounds when filled.

A tin seal locks the hasp to the lid. By opening and closing the fold of this seal several times it will break, thus permitting it to be easily withdrawn. When the lid is opened the tin cover can be torn off by means of a brass handle attached thereto.

BLANK CARTRIDGE, MODEL OF 1906.

The BLANK CARTRIDGE, model of 1906, Fig. 156, differs from the ball cartridge in the charge of powder and in the bullet and in the fact that the case is tinned. The bullet is of paper, hollow, and con-

Fig. 156.



tains a charge of 6 grains of "E. C." smokeless powder, which insures the breaking up of the bullet on leaving the bore. This charge is retained in the bullet by a drop of shellac. A coating of paraffin on

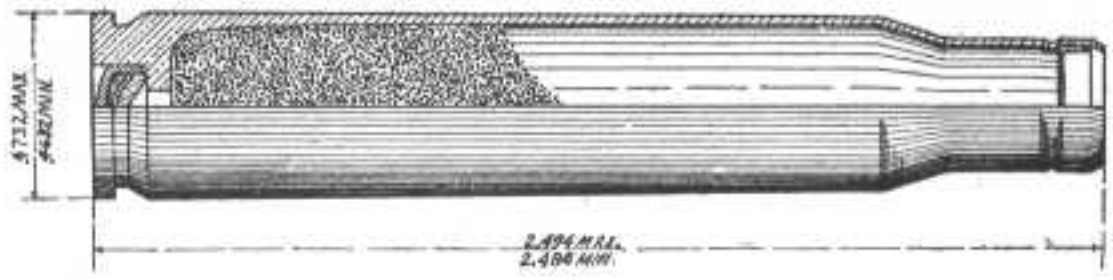
the outside of the bullet prevents the absorption of moisture by the paper. The propelling charge is 10 grains of "E. C." powder.

The cartridge is made 0.1 inch shorter than the ball cartridge. This is a measure of protection against the accidental assembling by the machine of a ball cartridge in a clip of blank ones.

THE BLANK CARTRIDGE, MODEL OF 1909.

In the manufacture of these blank cartridges, Fig. 157, cases are used which have been fired, or which have slight defects, rendering them unsuitable for use in ball cartridges. The charge is 12 grains of "E. C." powder.

Fig. 157.

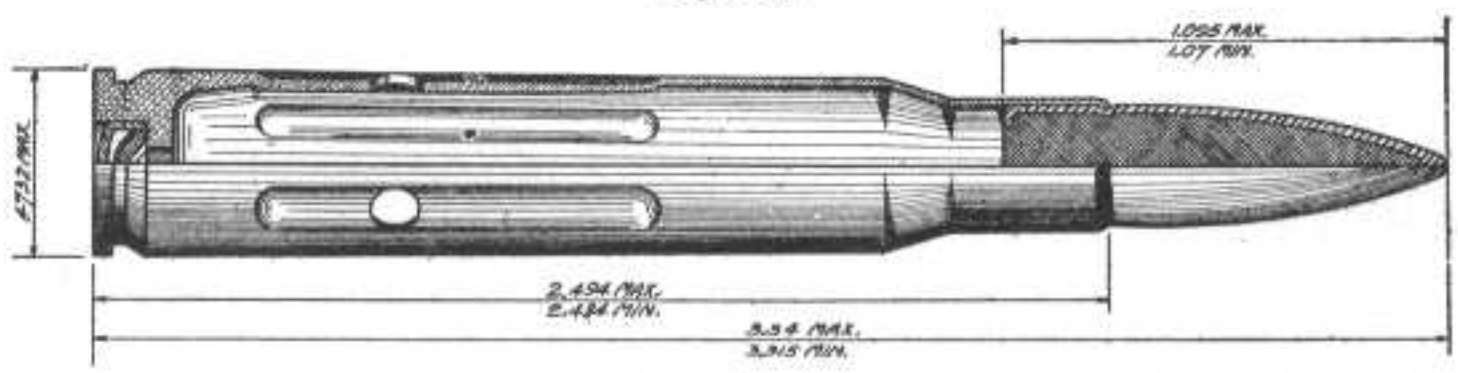


The case is closed by means of a paper cup inserted in the mouth of the case and shellacked to render the ammunition waterproof.

DUMMY CARTRIDGE.

The case of the DUMMY CARTRIDGE, Fig. 158, is tinned and provided with six longitudinal corrugations, also three circular holes in the corrugated portion.

Fig. 158.

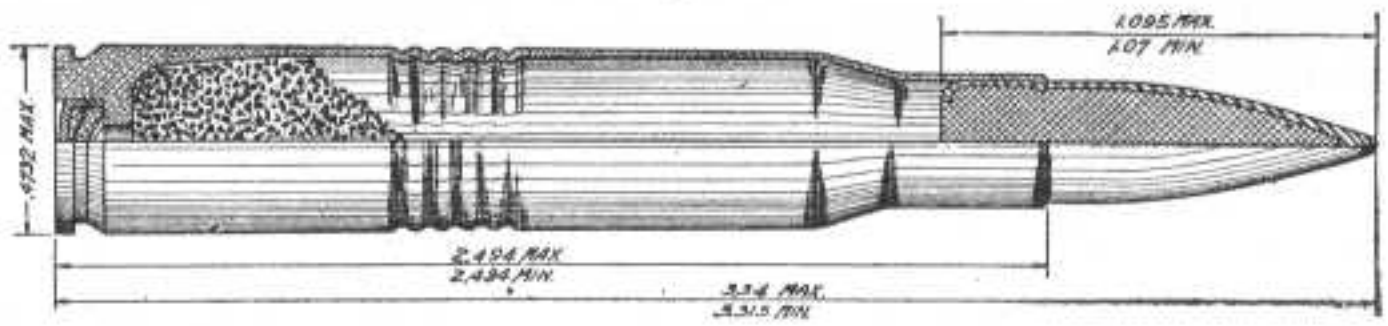


The tinning, corrugations, and holes afford unmistakable means for distinguishing the dummy from the ball cartridge, both by sight and touch. The bullet is the same as in the ball cartridge. The dummy primer has cup and anvil, but no percussion composition.

GUARD CARTRIDGE.

This cartridge, Fig. 159, differs from the ball cartridge in the charge

Fig. 159.

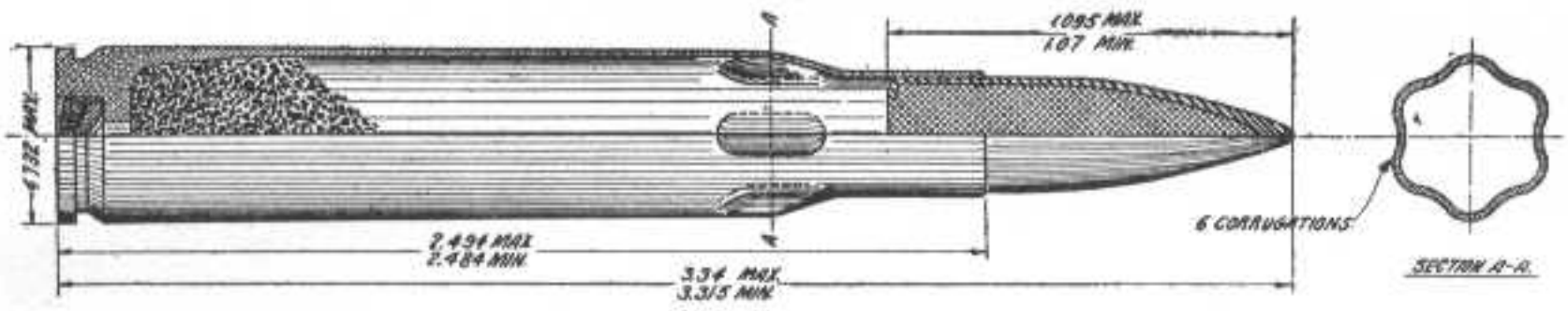


of powder and in the fact that second-class bullets having slight imperfections are used. Five cannelures encircle the body of the case

at about the middle, affording means for distinguishing it from the ball cartridge by either sight or touch.

The charge, about 9.1 grains bullseye powder, or 16.7 grains Du Pont Rifle Smokeless No. 1, gives a muzzle velocity of 1,200 feet per second. This cartridge gives good results at 100 yards and has sufficient accuracy for use at 150 and 200 yards. The range of 100 yards requires a sight elevation of 450 yards, and ranges of 200 and 300 yards require elevations of 650 and 850 yards, respectively.

Fig. 160.



The guard cartridge, Fig. 160, as now issued, differs from the old issue, Fig. 159, in that six longitudinal corrugations $\frac{3}{16}$ inch long start from the shoulder of the case. This affords means of distinguishing this cartridge from the ball cartridge. This cartridge has the same charge of powder, muzzle velocity, etc., as the old issue.

DESCRIPTION OF COLORS AND MARKINGS.

Adopted for the pasteboard and wooden boxes, also the metallic packing chests, in which the different kinds of model of 1906 caliber .30 ammunition are issued.

Kind of ammunition.	Label on pasteboard box.		Wooden packing box.		Metallic packing chest.	
	Color.	Markings.	Markings.		Markings.	
Ball cartridges [1]			Red band 4 inches wide around middle of length, and on full length of handles of box.	On both sides of boxes, the number, kind, model, caliber, kind of powder, and place of manufacture; on both ends of box the model and caliber; and on cover the ordnance insignia—all in black ink in large letters and figures.	Red band 2 inches wide around the box between the third and fourth corrugations; handle brackets also painted red.	On the bottom of the chest the number, caliber, model of ammunition, rifle, place, date of manufacture, kind and lot number of powder, and muzzle velocity. On lid of chest the ordnance insignia and "Small arms ammunition."
Blank cartridge Dummy cartridge Guard cartridge	Blue Green Orange	Number, kind, caliber, model, place of manufacture, cautions, and information are printed in black ink on the bandoleer or label.	Band 4 inches wide, of same color as label, around one end, and along half the length of handles, of box.			

[1] The ball cartridges are packed in bandoleers.

VARIATIONS AND CORRECTIONS.

The components of all machine-made ammunition must of necessity vary within certain practicable working limits, and every such variation, especially in the bullet and powder, has a corresponding effect upon the muzzle velocity. The service ammunition is loaded with a charge of powder which gives 2,700 feet per second muzzle velocity when fired from a standard rifle with selected bullets, the powder being at a temperature of 70° F.

The service ammunition will give a muzzle velocity of $2{,}700 \pm 20$ feet per second when fired on a normal day (70° F.). This velocity will vary directly with the temperature (T) 1.5 feet per second per degree. So that this ammunition fired on any but a normal day will give a muzzle velocity of $2{,}700 \pm 20 + (T - 70)$ 1.5 feet per second. Besides the variations due to the ammunition and temperature there are slight variations caused by the rifle which are of no great importance.

Small variations in velocity have small corresponding vertical deviations on the target. For example, at 1,000 yards an extreme vertical deviation of about 20 inches will be due to variations in muzzle velocity and 20 inches more due to other causes. The mean vertical deviation at this range, however, is less than 10 inches.

Another factor entering the question of range is the density of the air. The density of the air varies with the barometer, thermometer, and hygrometer readings.

The appended tables, I, II, III, and IV, will enable a close approximation to be made to the correct sight elevation for a particular condition.

In Table I will be found the value of $\frac{\delta_1}{\delta}$ for different temperatures and pressures of atmosphere. With $\frac{\delta_1}{\delta}$ found in Table I the corresponding elevation for a given range can be found in Table II, which is calculated for different values of $\frac{\delta_1}{\delta}$. With this elevation the corresponding sight elevation can be obtained from Table IV, which gives the range on the sight corresponding to different angles of departure.

Should the temperatures of the day vary to any great extent from 70° F. the corresponding correction can be obtained from Table III. In using these tables, calculations will be sufficiently accurate if interpolations are made by taking the proportional part of the differences in the tables.

The following problem is given as an illustration of the use of these tables:

Range 1,000 yards.
Barometer reading 29 inches.
Temperature 90° F.

From Table I,

$$\frac{\delta_1}{\delta} = 1.096.$$

From Table II, by interpolating between $\frac{\delta_1}{\delta} = 1.05$ and $\frac{\delta_1}{\delta} = 1.10$, the elevation for $\frac{\delta_1}{\delta} = 1.096$ is found to be 44.690 minutes.

To correct for the muzzle velocity, we have 2,700 feet per second $+(90-70)\ 1.5 = 2,730$.

From Table III,

Interpolating between 2,700 and 2,800, the elevation is 48.198 − 1.093 minutes. Since 48.198 minutes is the elevation for 1,000 yards for 2,700 feet per second muzzle velocity, it is seen that the additional 30 feet per second decreases the elevation by 1.093 minutes. It was found above that the elevation for 2,700 feet per second on this day was 44.690 minutes, so that the elevation for the given conditions is $44.690 - 1.093 = 43.597$ minutes, which from Table IV will be found to correspond to a sight elevation of 947 yards. This is subject to a further correction for each particular rifle. For example, if the rifle to which this correction is to be applied requires a sight setting of 1,010 yards under normal conditions, it will be necessary to add 10 yards to the result obtained above, so that the correct setting of this rifle would be 957 yards under the conditions given in the problem.

TABLE I.—VALUE OF $\frac{\delta_1}{\delta}$ FOR TEMPERATURE AND PRESSURE; OF ATMOSPHERE TWO-THIRDS SATURATED WITH MOISTURE.

F.	28 in.	29 in.	30 in.	31 in.	F.	28 in.	29 in.	30 in.	31 in.
0	0. 945	0. 912	0. 882	0. 853	23	0. 993	0. 959	0. 927	0. 897
1	. 947	. 914	. 884	. 855	24	. 995	. 961	. 929	. 899
2	. 949	. 916	. 886	. 857	25	. 997	. 963	. 931	. 901
3	. 951	. 918	. 888	. 859	26	1. 000	. 965	. 933	. 903
4	. 953	. 920	. 890	. 861	27	1. 002	. 967	. 935	. 905
5	. 955	. 922	. 892	. 863	28	1. 004	. 969	. 937	. 907
6	. 957	. 924	. 893	. 865	29	1. 006	. 971	. 939	. 909
7	. 959	. 926	. 895	. 867	30	1. 008	. 973	. 941	. 911
8	. 962	. 928	. 897	. 869	31	1. 010	. 975	. 943	. 912
9	. 964	. 930	. 899	. 870	32	1, 012	. 977	. 945	. 914
10	. 966	. 932	. 901	. 872	33	1. 014	. 979	. 947	. 916
11	. 968	. 935	. 903	. 874	34	1. 016	. 981	. 949	. 918
12	. 970	. 937	. 905	. 876	35	1. 018	. 983	. 951	. 920
13	. 972	. 939	. 907	. 878	36	1. 021	. 986	. 953	. 922
14	. 974	. 941	. 909	. 880	37	1. 023	. 988	. 955	. 924
15	. 976	. 943	. 911	. 882	38	1. 025	. 990	. 957	. 926
16	. 978	. 945	. 913	. 884	39	1. 027	. 992	. 958	. 928
17	. 981	. 947	. 915	. 886	40	1. 029	. 994	. 960	. 930
18	. 983	. 949	. 917	. 888	41	1. 031	. 996	. 962	. 932
19	. 985	. 951	. 919	. 890	42	1. 033	. 998	. 964	. 933
20	. 987	. 953	. 921	. 891	43	1. 035	1. 000	. 966	. 935
21	. 989	. 955	. 923	. 893	44	1. 037	1. 002	. 968	. 937
22	. 991	. 957	. 925	. 895	45	1. 040	1. 004	. 970	. 939

TABLE I.—VALUE OF $\frac{\delta_1}{\delta}$ FOR TEMPERATURE AND PRESSURE; OF ATMOSPHERE TWO-THIRDS SATURATED WITH MOISTURE—Contd.

F.	28 in.	29 in.	30 in.	31 in.	F.	28 in.	29 in.	30 in.	31 in.
46	1. 042	1. 006	0. 972	0. 941	74	1. 101	1. 063	1. 027	0. 995
47	1. 044	1. 008	. 974	. 943	75	1. 103	1. 065	1. 029	. 996
48	1. 046	1. 010	. 976	. 945	76	1. 105	1. 067	1. 031	. 998
49	1. 048	1. 012	. 978	. 947	77	1. 107	1. 069	1. 033	1. 000
50	1. 050	1. 014	. 980	. 949	78	1. 109	1. 071	1. 035	1. 002
51	1. 052	1. 016	. 982	. 951	79	1. 111	1. 073	1. 037	1. 004
52	1. 054	1. 018	. 984	. 953	80	1. 113	1. 075	1. 039	1. 006
53	1. 056	1. 020	. 986	. 954	81	1. 116	1. 077	1. 041	1. 008
54	1. 058	1. 022	. 988	. 956	82	1. 118	1. 079	1. 043	1. 010
55	1. 061	1. 024	. 990	. 958	83	1. 120	1. 081	1. 045	1. 012
56	1. 063	1. 026	. 992	. 960	84	1. 122	1. 083	1. 047	1. 014
57	1. 065	1. 028	. 994	. 962	85	1. 124	1. 085	1. 049	1. 016
58	1. 067	1. 030	. 996	. 964	86	1. 126	1. 088	1. 051	1. 017
59	1. 069	1. 032	. 998	. 966	87	1. 128	1. 090	1. 053	1. 019
60	1. 071	1. 034	1. 000	. 968	88	1. 130	1. 092	1. 055	1. 021
61	1. 073	1. 037	1. 002	. 970	89	1. 132	1. 094	1. 057	1. 023
62	1. 075	1. 039	1. 004	. 972	90	1. 135	1. 096	1. 059	1. 025
63	1. 078	1. 041	1. 006	. 974	91	1. 137	1. 098	1. 061	1. 027
64	1. 080	1. 043	1. 008	. 975	92	1. 139	1. 100	1. 063	1. 029
65	1. 082	1. 045	1. 010	. 977	93	1. 141	1. 102	1. 065	1. 031
66	1. 084	1. 047	1. 012	. 979	94	1. 143	1. 104	1. 067	1. 033
67	1. 086	1. 049	1. 014	. 981	95	1. 145	1. 106	1. 069	1. 035
68	1. 088	1. 051	1. 016	. 983	96	1. 147	1. 108	1. 071	1. 037
69	1. 090	1. 053	1. 018	. 985	97	1. 149	1. 110	1. 073	1. 038
70	1. 092	1. 055	1. 020	. 987	98	1. 151	1. 112	1. 075	1. 040
71	1. 094	1. 057	1. 022	. 989	99	1. 154	1. 114	1. 077	1. 042
72	1. 097	1. 059	1. 024	. 991	100	1. 156	1. 116	1. 079	1. 044
73	1. 099	1. 061	1. 025	. 993					

TABLE II.

[Muzzle velocity, 2,700 feet per second.]

Range.	ANGLE OF DEPARTURES WHEN $\frac{\delta_1}{\delta}$						
	=0.85.	=0.90.	=0.95.	=1.	=1.05.	=1.10.	=1.15.
Yards.	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*
100	0 2. 447	0 2. 439	0 2. 4315	0 2. 424	0 2. 416	0 2. 410	0 2. 403
200	0 5. 277	0 5. 229	0 5. 173	0 5. 152	0 5. 121	0 5. 090	0 5. 064
300	0 8. 585	0 8. 466	0 8. 365	0 8. 275	0 8. 192	0 8. 118	0 8. 051
400	0 12. 458	0 12. 216	0 12. 012	0 11. 831	0 11. 673	0 11. 530	0 11. 483
500	0 17. 048	0 16. 612	0 16. 240	0 15. 918	0 15. 638	0 15. 380	0 15. 163
600	0 22. 483	0 21. 766	0 21. 170	0 20. 650	0 20. 186	0 19. 775	0 19. 420
700	0 28. 965	0 27. 854	0 26. 913	0 26. 104	0 25. 400	0 24. 795	0 24. 259
800	0 36. 645	0 35. 026	0 33. 637	0 32. 441	0 31. 413	0 30. 51	0 29. 735
900	0 45. 617	0 43. 378	0 41. 447	0 39. 785	0 38. 334	0 37. 069	0 35. 961
1, 000	0 55. 904	0 52. 970	0 50. 422	0 48. 198	0 46. 256	0 44. 554	0 43. 054
1, 100	1 7. 488	1 3. 798	1 1. 838	0 57. 728	0 55. 228	0 53. 020	0 51. 066
1, 200	1 20. 369	1 15. 856	1 11. 881	1 8. 379	1 5. 265	1 2. 497	1 0. 040
1, 300	1 34. 554	1 29. 077	1 24. 358	1 20. 131	1 16. 364	1 13. 001	1 9. 988
1, 400	1 50. 051	1 43. 658	1 38. 003	1 32. 987	1 28. 508	1 24. 491	1 20. 899
1, 500	2 6. 938	1 59. 433	1 52. 815	1 46. 951	1 41. 937	1 36. 997	1 32. 760
1, 600	2 25. 183	2 16. 498	2 8. 828	2 2. 038	1 55. 971	1 50. 504	1 45. 598
1, 700	2 44. 893	2 34. 883	2 26. 077	2 18. 272	2 11. 300	2 5. 035	1 59. 405
1, 800	3 6. 100	2 54. 625	2 44. 575	2 35. 674	2 27. 708	2 20. 591	2 14. 187
1, 900	3 28. 92	3 15. 754	3 4. 362	2 54. 277	2 45. 274	2 37. 207	2 29. 951
2, 000	3 53. 408	3 38. 504	3 25. 540	3 14. 111	3 3. 985	2 54. 904	2 46. 738

TABLE III.

ANGLE OF DEPARTURE WHEN $\frac{\partial_1}{\partial}=1$.				ANGLE OF DEPARTURE WHEN $\frac{\partial_1}{\partial}=1$.			
Range.	M. V.=2,600 f. s. ϕ=	M. V.=2,700 f. s. ϕ=	M. V.=2,800 f. s. ϕ=	Range.	M. V.=2,600 f. s. ϕ=	M. V.=2,700 f. s. ϕ=	M. V.=2,800 f. s. ϕ=
Yards.	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*	*Yards.*	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*
100.....	0 2.612	0 2.424	0 2.251	1,100....	1 2.394	0 57.728	0 53.447
200.....	0 5.573	0 5.152	0 4.790	1,200....	1 13.696	1 8.379	1 3.427
300.....	0 8.941	0 8.275	0 7.668	1,300....	1 26.106	1 20.131	1 14.575
400.....	0 12.806	0 11.831	0 10.959	1,400....	1 39.633	1 32.987	1 26.783
500.....	0 17.248	0 15.918	0 14.736	1,500....	1 54.266	1 46.951	1 40.108
600.....	0 22.378	0 20.650	0 19.091	1,600....	2 10.050	2 2.038	1 56.386
700.....	0 28.315	0 26.104	0 24.120	1,700....	2 26.985	2 18.272	2 10.070
800.....	0 35.205	0 32.441	0 29.956	1,800....	2 45.099	2 35.674	2 26.790
900.....	0 43.152	0 39.785	0 36.734	1,900....	3 4.429	2 54.277	2 44.689
1,000....	0 52.206	0 48.198	0 44.552	2,000....	3 25.03	3 14.111	3 3.793

TABLE IV.—ANGLE OF DEPARTURE FOR EVERY 25 YARDS FROM 100 TO 2,000 WHEN

$$\frac{\partial_1}{\partial}=1.$$

[Showing the relation between the range marked on sight and angle of departure as computed.]

Range.	Angle of departure.	Range.	Angle of departure.	Range.	Angle of departure.	Range.	Angle of departure.
Yards.	*Deg. Min.*	*Yards.*	*Deg. Min.*	*Yards.*	*Deg. Min.*	*Yards.*	*Deg. Min.*
100....	0 2.424	650...	0 23.273	1,200..	1 8.379	1,750..	2 26.824
125....	0 3.073	675...	0 24.660	1,225..	1 11.150	1,775..	2 31.211
150....	0 3.744	700...	0 26.104	1,250..	1 14.112	1,800..	2 35.674
175....	0 4.434	725...	0 27.602	1,275..	1 17.080	1,825..	2 40.211
200....	0 5.152	750...	0 29.158	1,300..	1 20.131	1,850..	2 44.823
225....	0 5.894	775...	0 30.767	1,325..	1 23.238	1,875..	2 49.511
250....	0 6.664	800...	0 32.441	1,350..	1 26.421	1,900..	2 54.277
275....	0 7.454	825...	0 34.181	1,375..	1 29.665	1,925..	2 59.111
300....	0 8.275	850...	0 35.984	1,400..	1 32.987	1,950..	3 4.032
325....	0 9.119	875...	0 37.851	1,425..	1 36.368	1,975..	3 9.028
350....	0 9.996	900...	0 39.785	1,450..	1 39.828	2,000..	3 14.111
375....	0 10.897	925...	0 41.786	1,475..	1 43.355		
400....	0 11.831	950...	0 43.852	1,500..	1 46.951		
425....	0 12.800	975...	0 45.991	1,525..	1 50.618		
450....	0 13.800	1,000..	0 48.198	1,550..	1 54.354		
475....	0 14.844	1,025..	0 50.482	1,575..	1 58.158		
500....	0 15.918	1,050..	0 52.826	1,600..	2 2.038		
525....	0 17.036	1,075..	0 55.241	1,625..	2 5.982		
550....	0 18.194	1,100..	0 57.728	1,650..	2 10.003		
575....	0 19.402	1,125..	1 0.290	1,675..	2 14.098		
600....	0 20.650	1,150..	1 2.916	1,700..	2 18.272		
625....	0 21.943	1,175..	1 5.615	1,725..	2 22.512		

EXTERIOR BALLISTICS.

RAPIDITY OF FIRE.

Twenty-three aimed shots have been fired in one minute with this rifle, used as a single-loader, and 25 shots in the same time, using magazine fire.

Firing from the hip without aim, 30 shots have been fired in one minute, using rifle as a single-loader, and 40 shots in one minute, using magazine fire.

MAXIMUM RANGE.

[Computed.]

Maximum range.	Elevation.	Time of flight.
4,891.6 yards.	45 degrees.	38.058 seconds.

PRESSURE.

The powder pressure in the chamber of this rifle is about 51,000 pounds per square inch.

RECOIL.

[Computed.]

The maximum energy of free recoil of this rifle is 14.98 foot-pounds.

ACCURACY.

[As determined by firings to date.]

Range, yards.	Deviation.		
	Mean vertical.	Mean horizontal.	Mean radius.
	Inches.	*Inches.*	*Inches.*
100	0.6	0.6	0.8
200	1.1	1.1	1.5
300	1.7	1.7	2.3
400	2.3	2.3	3.2
500	3.0	3.0	4.1
600	3.6	3.6	5.0
700	4.3	4.3	6.0
800	5.0	5.0	7.1
900	5.9	5.8	8.3
1,000	6.5	6.4	9.6

PENETRATION.

Material.	Penetration.			
	50 feet.	100 yards.	500 yards.	1,000 yards.
	Inches.	*Inches.*	*Inches.*	*Inches.*
White-pine butts made of 1-inch boards placed 1 inch apart	59. 98	52. 8	26. 36	10. 48
Moist sand	10. 06	14. 02	16. 1	13. 9
Dry sand	6. 32	6. 88	13. 12	10. 86
Loam practically free from sand	19. 9	17. 46	23. 62	17. 46
Thoroughly seasoned oak across the grain	34. 19	31. 18	14. 328	.....
Brick wall	.....	5. 5	.....	.....
Low steel (boiler plate)	. 528	. 40	. 01	. 0

POINT BLANK DANGER SPACE.

[Battle sight, angle of departure, (ϕ)= 0° 18′ 3.97″.]

Firing position.	Assumed height of line of sight above ground.	Point blank danger space (computed).
	Inches.	*Yards.*
Standing	56	203. 0
Kneeling	30	636. 6
Lying down	12	587. 2
[Barrel horizontal.]		
Standing	56	421. 7
Kneeling	30	324. 3
Prone	12	210. 1

TABLE OF FIRE FOR UNITED STATES RIFLE, CALIBER .30, MODEL OF 1903, MODEL OF 1905 SIGHT, AND 1906 AMMUNITION.

[Initial velocity=2,700 feet per second. C=0.3894075, determined experimentally at Frankford Arsenal.]

Range (yards).	Angle of departure (computed).	Angle of elevation (verified by firing).	Time of flight (computed).	Angle of fall (computed).	Remaining velocity (computed).	Remaining energy (computed).	Summit of trajectory (computed).	
							Height.	Distance from muzzle.
	Deg. Min.	*Deg. Min.*	*Seconds.*	*Deg. Min.*	*Feet per second.*	*Foot-pounds.*	*Feet.*	*Yards.*
100	0 2.424	0 2.40	0.116+	0 2.576	2,464.88	2,034.25	0.0546	50.9
200	0 5.152+	0 5.18	.243+	0 5.827+	2,244.57+	1,686.80	0.2409+	103.8
300	0 8.275	0 8.26	.384+	0 9.978	2,039.1	1,392.15	0.5956+	157.52
400	0 11.831	0 11.83	.693+	0 15.240	1,846.42	1,141.5	1.1681	211.94
500	0 15.918+	0 15.90	.709+	0 21.937	1,668.57	932.19	2.0356	270.56
600	0 20.650+	0 20.68	.899+	0 30.435	1,509.55	762.97	3.2733	329.47
700	0 26.104+	0 26.15	1.108+	0 41.137	1,361.36	620.52	4.9892	390.00
800	0 32.441	0 32.50	1.340	0 54.543+	1,238.25	513.37	7.319 +	452.23
900	0 39.785+	0 39.86	1.593	1 10.814+	1,141.62	436.37	10.434	516.13
1,000	0 48.198+	0 48.30	1.864+	1 29.669	1,068.21	382.36	14.480	580.70
1,100	0 57.728+	0 57.80	2.153+	1 50.917	1,012.17	343.02	19.553	643.60
1,200	1 8.379	1 8.55	2.458+	2 14.310+	966.25	312.60	25.846	706.6
1,300	1 20.131+	1 20.35	2.776+	2 39.762	924.99	285.23	33.397	767.3
1,400	1 32.987	1 33.25	3.108+	3 7.418+	887.71	263.85	42.332	826.76
1,500	1 46.951+	1 47.26	3.453+	3 37.390+	853.05	243.65	52.778	885.3
1,600	2 2.038+	2 2.38	3.813+	4 9.745	821.59	226.01	64.838	943.2
1,700	2 18.272+	2 18.68	4.189+	4 44.621	792.20	210.12	78.630	1,000.9
1,800	2 35.674	2 36.12	4.572+	5 22.245	765.56	196.23	94.262	1.058.5
1,900	2 54.277+	2 54.90	4.977+	6 2.746	738.65	182.68	111.93	1,116.3
2,000	3 14.111+	3 14.70	5.394+	6 46.364	713.53	170.46	131.76	1,174.46
2,100	3 35.247	.....	5.827+	7 33.479	689.07	158.98	153.98	1,233.2
2,200	3 57.744	.....	6.277+	8 24.208	665.78	148.41	178.81	1,292.3
2,300	4 21.664	.....	6.744+	9 18.963	643.50	138.64	206.52	1,352.4
2,400	4 47.091	.....	7.182+	10 18.230	622.11	129.58	236.58	1,412.67
2,500	5 14.127	.....	7.734+	11 21.568	601.89	121.29	271.39	1,473.6
2,600	5 42.850	.....	8.258+	12 30.050	582.58	113.63	309.24	1,535.1
2,700	6 13.383	.....	8.803+	13 43.750	564.25	106.60	351.13	1,597.3
2,800	6 45.854	.....	9.370+	15 2.970	546.93	100.15	397.49	1,660.0
2,900	7 20.404	.....	9.962	16 29.021+	530.66	94.28	448.77	1,723.6
3,000	7 57.175	.....	10.577	17 59.20	514.29	88.62	505.48	1,787.7
3,100	8 36.350	.....	11.219	19 36.801	501.09	84.07	568.18	1,852.6

ORDINATES OF TRAJECTORY ABOVE LINE OF SIGHT.

[Computed.]

Horizontal distance (yards).	100 yards.	200 yards.	300 yards.	400 yards.	500 yards.	600 yards.	700 yards.	800 yards.	900 yards.	1,000 yards.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
100	0									
200	.238	0								
300	.511	.545	0							
400	.821	1.165	.931	0						
500	1.178	1.879	2.001	1.427	0					
600	1.591	2.705	3.240	3.078	2.065	0				
700	2.067	3.657	4.668	4.982	4.444	2.855	0			
800	2.619	4.762	6.326	7.194	7.021	6.173	3.871	0		
900	3.260	6.045	8.249	9.758	10.413	10.018	8.357	5.127	0	
1,000	3.994	7.513	10.452	12.695	14.085	14.423	13.496	11.000	6.607	0
1,100	4.827	9.177	12.947	16.022	18.243	19.413	19.317	17.652	14.090	8.314
1,200	5.756	11.036	15.736	19.740	22.891	24.991	25.824	25.088	22.455	17.607
1,300	6.782	13.088	18.814	23.844	28.020	31.146	33.004	33.293	31.685	27.861
1,400	7.905	15.333	22.182	28.334	33.632	37.879	40.859	42.270	41.782	39.079
1,500	9.126	17.775	25.844	33.216	39.735	45.202	49.400	52.029	52.760	51.274
1,600	10.442	20.408	29.794	38.483	46.317	53.100	58.615	62.560	64.605	64.434
1,700	11.861	23.245	34.049	44.156	53.408	61.608	68.540	73.901	77.362	78.606
1,800	13.381	26.287	38.611	50.238	61.009	70.729	79.182	86.060	91.038	93.797
1,900	15.009	29.541	43.492	56.745	69.143	80.488	90.563	99.066	105.66	110.05
2,000	16.745	33.013	48.699	63.686	77.820	90.897	102.70	112.94	121.27	127.38
2,100	18.596	36.714	54.250	71.088	87.069	101.99	115.65	127.73	137.91	145.86
2,200	20.567	40.657	60.164	78.971	96.921	113.81	129.44	143.48	155.62	165.54
2,300	22.666	44.853	66.457	87.362	107.40	126.39	144.11	160.25	174.48	186.48
2,400	24.898	48.978	73.152	96.287	118.48	139.68	159.61	177.96	200.20	209.09
2,500	27.276	54.072	80.284	105.79	124.55	154.03	176.34	197.08	215.89	232.48
2,600	29.805	59.130	87.869	115.90	143.08	169.19	194.03	217.28	238.61	257.71
2,700	32.498	64.516	95.946	126.67	156.53	185.33	212.85	238.73	262.80	284.57
2,800	35.368	70.255	104.55	138.14	170.87	202.53	232.91	261.70	288.56	313.18
2,900	38.517	76.375	113.73	150.37	186.16	220.87	254.30	286.13	316.03	343.68
3,000	41.695	82.906	123.52	163.43	202.47	240.44	277.12	312.20	345.34	376.23
3,100	45.185	89.885	133.99	177.38	219.90	261.35	301.50	340.05	376.66	411.00

ORDINATES OF TRAJECTORY ABOVE LINE OF SIGHT—Continued.

[Computed.]

Horizontal distance (yards).	1,100 yards.	1,200 yards.	1,300 yards.	1,400 yards.	1,500 yards.	1,600 yards.	1,700 yards.	1,800 yards.	1,900 yards.	2,000 yards.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
100										
200										
300										
400										
500										
600										
700										
800										
900										
1,000										
1,100	0									
1,200	10. 221	0								
1,300	21. 499	12. 301	0							
1,400	33. 838	25. 759	14. 577	0						
1,500	47. 248	40. 384	30. 415	17. 050	0					
1,600	61. 723	56. 174	47. 519	35. 467	19. 730	0				
1,700	77. 309	73. 173	65. 929	55. 288	40. 960	22. 638	0			
1,800	94. 015	91. 395	85. 666	76. 539	63. 719	46. 906	25. 779	0		
1,900	111. 88	110. 88	106. 77	99. 258	88. 053	72. 851	53. 328	29. 161	0	
2,000	130. 95	131. 67	129. 28	123. 49	114. 00	100. 52	82. 711	60. 255	32. 801	0
2,100	151. 30	153. 83	153. 28	149. 32	141. 67	130. 01	114. 03	93. 393	67. 764	36. 779
2,200	172. 91	177. 43	178. 83	176. 83	171. 12	161. 41	147. 37	128. 67	104. 97	75. 923
2,300	195. 94	202. 54	206. 02	206. 09	202. 46	194. 81	182. 84	166. 19	144. 55	117. 54
2,400	220. 43	229. 24	234. 94	237. 22	235. 78	230. 87	220. 55	206. 10	186. 64	161. 80
2,500	246. 51	257. 68	265. 72	270. 35	271. 25	268. 14	260. 69	248. 56	231. 41	208. 88
2,600	274. 24	287. 92	298. 46	305. 58	308. 97	308. 34	303. 36	293. 69	279. 00	258. 93
2,700	303. 77	320. 11	333. 31	343. 08	349. 11	351. 12	348. 77	341. 72	329. 64	312. 17
2,800	335. 22	354. 40	370. 42	383. 01	391. 87	396. 68	397. 12	392. 86	383. 55	368. 84
2,900	368. 76	390. 95	409. 99	425. 58	437. 43	445. 22	448. 64	447. 34	440. 99	429. 21
3,000	404. 44	429. 94	452. 19	470. 99	486. 02	496. 99	503. 58	505. 43	502. 21	493. 55
3,100	442. 74	471. 59	497. 27	519. 48	537. 92	552. 28	562. 24	567. 44	567. 57	562. 23

ORDINATES OF TRAJECTORY ABOVE LINE OF SIGHT—Continued.

[Computed.]

Horizontal distance (yards).	2,100 yards.	2,200 yards.	2,300 yards.	2,400 yards.	2,500 yards.	2,600 yards.	2,700 yards.	2,800 yards.	2,900 yards.	3,000 yards.	3,100 yards.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
100											
200											
300											
400											
500											
600											
700											
800											
900											
1,000											
1,100											
1,200											
1,300											
1,400											
1,500											
1,600											
1,700											
1,800											
1,900											
2,000											
2,100	0										
2,200	41.067	0									
2,300	84.735	45.703	0								
2,400	131.16	94.293	50.744	0							
2,500	180.54	145.96	104.69	55.796	0						
2,600	233.02	200.87	162.02	115.53	62.137	0					
2,700	288.85	259.28	223.00	179.06	126.72	68.585	0				
2,800	348.27	321.44	287.87	246.64	198.47	141.53	75.598	0			
2,900	411.56	387.63	356.96	318.60	273.28	218.66	156.04	83.232	0		
3,000	479.03	458.17	430.57	395.25	352.95	301.84	241.69	171.82	91.512	0	
3,100	551.00	533.44	509.09	477.01	437.93	389.99	333.00	266.25	189.02	100.55	0

DANGEROUS SPACES.

[The dangerous spaces were calculated under the assumption that the gun, when fired, is 12 inches above the ground, that the height of a man is 68 inches, that the head of a man on horseback is 8 feet above the ground, and that the gun is aimed at the middle point of the target.]

Rifle against infantry and cavalry.

Distance to target (yards).	Rising branch of trajectory.		Falling branch of trajectory.				Continuous dangerous space at target.		Total.	
			In front of target.		In rear of target.					
	Infantry.	Cavalry.	Infantry.	Cavalry.	Infantry.	Cavalry.	Infantry.	Cavalry.	Infantry.	Cavalry.
	Yards.	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*
100	All.	All.	All.	All.	582.2	172.6+197.2	682.2	272.6	682.2	469.8
200	All.	All.	All.	All.	340.9	464.2	540.9	664.2	540.9	664.2
300	All.	All.	All.	All.	233.4	318.0	533.4	618.0	533.4	618.0
400	All.	All.	All.	All.	168.7	230.5	568.7	630.5	568.7	630.5
500	All.	All.	All.	All.	125.0	172.0	625.0	672.0	625.0	672.0
600	All.	All.	All.	All.	94.7	130.4	694.7	730.4	694.7	730.4
700	232.7	All.	113.2	All.	72.1	99.9	185.3	799.9	418.0	799.9
800	174.5	273.5	73.4	120.5	55.6	77.3	129.0	197.8	303.5	471.3
900	138.2	210.2	52.6	80.3	43.6	61.0	96.2	141.3	234.4	351.5
1,000	112.4	169.3	39.7	59.0	34.8	48.9	74.5	107.9	186.9	277.2
1,100	93.1	139.7	31.4	45.8	28.3	39.9	59.7	85.7	152.8	225.4
1,200	78.3	117.3	25.5	36.8	23.6	34.7	49.1	71.5	127.4	188.8
1,300	66.7	99.8	21.2	30.4	19.9	28.0	41.1	58.4	107.8	158.2
1,400	57.4	85.8	18.0	25.6	17.0	24.0	35.0	49.6	92.4	135.4
1,500	49.8	74.6	15.3	21.9	14.7	20.8	30.0	42.7	79.8	117.3
1,600	43.7	65.3	13.3	19.0	12.7	18.0	26.0	37.0	69.7	102.3
1,700	38.5	57.7	11.5	16.6	11.3	15.8	22.8	32.4	61.3	90.1
1,800	34.2	51.2	10.4	14.7	9.8	13.9	20.2	28.6	54.4	79.8
1,900	30.5	45.8	9.2	13.0	8.7	12.3	17.9	25.3	48.4	71.1
2,000	27.4	41.1	8.2	11.5	7.8	10.8	16.0	22.3	43.4	63.4
2,100	24.7	37.0	7.8	11.1	6.5	9.2	14.3	20.3	39.0	57.3
2,200	22.4	33.5	7.0	9.9	5.9	8.3	12.9	18.2	35.3	51.7
2,300	20.3	30.5	6.3	8.9	5.2	7.4	11.5	16.3	31.8	46.8
2,400	18.5	27.7	5.7	8.0	4.8	6.7	10.5	14.7	29.0	42.4
2,500	16.9	25.3	5.2	7.3	4.3	6.1	9.5	13.4	26.4	38.7
2,600	15.5	23.2	4.7	6.6	3.9	5.5	8.6	12.1	24.1	35.3
2,700	14.2	21.3	4.3	6.0	3.5	5.0	7.8	11.0	22.0	32.3
2,800	13.0	19.6	3.9	5.5	3.2	4.5	7.1	10.0	20.1	29.6

HORIZONTAL DEVIATION.

The rifle has a right-hand twist, and the drift proper is therefore to the right. There is, however, a slight lateral jump to the left, and the total horizontal deviation of the bullet, excluding wind, is the algebraic sum of the drift and the lateral jump. The trajectory is found to be very slightly to the left of the central or uncorrected line of sight up to a range of 500 yards, and beyond that range to the right of this line. In order to minimize the deviations at the most important ranges, the drift slot on the sight leaf is so cut as to make the trajectory cross the adjusted line of sight at a range of 500 yards. The deviations under these conditions are shown in column (4) of the table below.

This drift and the deviations due to wind, given below, have been determined by experimental firings, up to 2,000 yards.

Range (yards). (1)	Drift with targeted rifles, model of 1905 sights graduated for 1906 ammunition.					Deviation at target produced by a 1-mile wind normal to the plane of fire. (5)
	Total drift. (2)		Drift corrected by sight leaf. (3)		Drift uncorrected (right). (4)	
	Left.	Right.	Left.	Right.		
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
100	0.26		0.26		0.0	0.1
200	0.42		0.42		0.0	0.3
300	0.45		0.45		0.0	0.8
400	0.32		0.32		0.0	1.5
500	0.0		0.0		0.0	2.4
600		0.55		0.55	0.0	3.6
700		2.0		1.4	0.6	5.1
800		4.5		2.6	1.9	6.9
900		8.2		4.2	4.0	9.1
1,000		13.0		6.3	6.7	11.5
1,100		20.5		9.0	11.5	14.3
1,200		29.3		12.3	17.0	17.2
1,300		40.0		16.3	23.7	20.4
1,400		50.7		21.1	29.6	23.8
1,500		61.75		26.75	35.0	27.4
1,600		74.8		33.3	41.5	31.2
1,700		90.0		40.8	49.2	35.2
1,800		107.0		49.3	57.7	39.4
1,900		126.5		59.1	67.4	43.9
2,000		148.5		69.9	78.6	48.6
2,100		174.5		82.1	92.4	53.5
2,200		202.0		95.6	106.4	58.6
2,300		232.0		110.4	121.6	63.8
2,400		264.0		126.7	137.3	69.1
2,500		301.0		145.3	155.7	74.6
2,600		339.0		165.4	173.6	80.0
2,700		381.0		188.1	192.9	84.5
2,800		428.0		212.8	215.2	90.3
2,850		456.0		226.3	229.7	93.2

CORRECTIONS CORRESPONDING TO ONE POINT OF THE DEFLECTION SCALE AND TO A CHANGE IN ELEVATION OF 25 YARDS.

Range (yards).	Correction caused by moving the eyepiece one point.	Correction corresponding to a change in elevation of 25 yards.	Range (yards).	Correction caused by moving the eyepiece one point.	Correction corresponding to a change in elevation of 25 yards.
100	4.311	0.72405	1,500	64.665	59.185
200	8.622	1.6189	1,600	68.976	68.337
300	12.933	2.7701	1,700	73.287	77.795
400	17.244	4.328	1,800	77.598	88.228
500	21.555	6.182	1,900	81.909	98.927
600	25.866	8.542	2,000	86.220	111.45
700	30.177	11.674	2,100	90.531	123.86
800	34.488	15.620	2,200	94.842	136.91
900	38.799	19.769	2,300	99.153	150.62
1,000	43.110	24.813	2,400	103.464	165.96
1,100	47.421	30.874	2,500	107.775	186.09
1,200	51.732	37.097	2,600	112.086	207.29
1,300	56.043	43.890	2,700	116.397	230.64
1,400	60.354	51.822	2,800	120.708	271.07

TABLE SHOWING NUMBER OF POINTS OF DEFLECTION OR WINDAGE NECESSARY TO CORRECT FOR A 10-MILE-AN-HOUR WIND, DRIFT NOT CONSIDERED.

[Computed.]

Range (yards).	Direction of wind.			Range (yards).	Direction of wind.		
	III, IX.	II, IV, VIII, X.	I, V, VII, XI.		III, IX.	II, IV, VIII, X.	I, V, VII, XI.
100	0.23	0.2	0.1	1,600	4.52	3.92	2.26
200	.34	.31	.17	1,700	4.80	4.15	2.40
300	.61	.53	.30	1,800	5.01	4.34	2.50
400	.86	.75	.43	1,900	5.36	4.64	2.68
500	1.11	.96	.55	2,000	5.63	4.87	2.81
600	1.39	1.2	.69	2,100	5.91	5.11	2.95
700	1.68	1.45	.84	2,200	6.17	5.35	3.09
800	2.00	1.73	1.00	2,300	6.44	5.57	3.22
900	2.34	2.03	1.17	2,400	6.67	5.77	3.33
1,000	2.67	2.30	1.33	2,500	6.92	5.99	3.46
1,100	3.01	2.61	1.50	2,600	7.14	6.18	3.57
1,200	3.32	2.88	1.66	2,700	7.26	6.29	3.63
1,300	3.64	3.15	1.82	2,800	7.48	6.48	3.74
1,400	3.94	3.41	1.97	2,850	7.58	6.56	3.79
1,500	4.24	3.66	2.12				

LONGITUDINAL WIND COMPONENTS FOR MODEL OF 1903 RIFLE, 1905 SIGHT, 1906 AMMUNITION (CALCULATED).

[+Δ X=yards short at target on horizontal plane; −Δ X=yards over at target on horizontal plane; +Δ Y=distance above at target in vertical plane; −Δ Y=distance below at target in vertical plane.]

Wind velocities.....	5 miles per hour.						10 miles per hour.						15 miles per hour.					
Direction of wind....	VI.	XII.	VI.		XII.		VI.	XII.	VI.		XII.		VI.	XII.	VI.		XII.	
Variation at target...	+Δ X	−Δ X	+Δ Y		−Δ Y		+Δ X	−Δ X	+Δ Y		−Δ Y		+Δ X	−Δ X	+Δ Y		−Δ Y	
Range (yards).	*Yards.*	*Yards.*	*Ft.*	*in.*	*Ft.*	*in.*	*Yards.*	*Yards.*	*Ft.*	*in.*	*Ft.*	*in.*	*Yards.*	*Yards.*	*Ft.*	*in.*	*Ft.*	*in.*
100.....	0.48	0.47	0	0.013	0	0.012	0.97	0.92	0	0.03	0	0.02	1.41	1.40	0	0.04	0	0.0037
200.....	1.00	1.00	0	.061	0	.060	2.03	2.00	0	.12	0	.11	3.02	3.00	0	.18	0	.18
300.....	1.59	1.59	0	.203	0	.203	3.22	3.15	0	.41	0	.40	4.76	4.72	0	.61	0	.60
400.....	2.25	2.23	0	.344	0	.343	4.50	4.40	0	.69	0	.68	6.80	6.60	0	1.05	0	1.02
500.....	3.06	3.04	0	.702	0	.700	6.1	6.04	0	1.4	0	1.3	9.20	9.03	0	2.10	0	2.07
600.....	3.99	3.95	0	1.27	0	1.26	8.0	7.9	0	2.5	0	2.4	12.0	11.8	0	3.84	0	3.75
700.....	5.08	5.02	0	2.19	0	2.16	10.2	9.9	0	4.4	0	4.3	15.3	14.9	0	6.6	0	6.4
800.....	6.80	6.69	0	3.88	0	3.82	13.6	13.3	0	7.8	0	7.6	20.6	19.9	0	11.8	0	11.3
900.....	9.85	9.61	0	7.30	0	7.12	19.9	19	1	2.7	1	2.1	30.2	28.2	1	10.0	1	9.0
1,000.....	13.23	12.91	1	.42	1	.13	26.7	25.5	2	1.1	1	11.9	40.6	37.8	3	2.2	2	11.5
1,100.....	16.80	16.39	1	7.52	1	7.04	34.0	33.0	3	3.5	3	2.5	51.7	47.9	5	.1	4	7.7
1,200.....	20.34	20.03	2	4.62	2	4.19	40.9	39.6	4	9.6	4	7.7	61.3	58.6	8	11.9	6	10.5
1,300.....	22.67	22.39	3	1.96	3	1.50	45.6	44.5	6	4.4	6	2.4	68.9	66.3	9	7.4	9	3.0
1,400.....	25.14	24.77	4	1.40	4	.70	50.6	49.3	8	3.6	8	.8	76.4	73.4	12	6.2	12	.2
1,500.....	27.69	27.32	5	3.11	5	2.3	55.7	54.3	10	7.0	10	3.7	84.2	80.8	15	11.9	18	4.3
1,600.....	30.36	29.94	6	7.50	6	6.4	61.1	59.4	13	4.1	12	11.7	93.5	88.5	20	5.0	19	4.0
1,700.....	33.03	32.63	8	2.6	8	1.4	66.3	64.7	16	6.2	16	1.4	99.6	96.5	24	9.6	24	.2
1,800.....	34.98	34.59	9	10.4	9	9.0	70.2	69.1	19	9.6	19	.5	105.7	103.4	29	9.6	29	2.0
1,900.....	36.93	36.68	11	8.8	11	7.8	74.1	73.1	23	6.6	23	2.6	111.7	109.2	35	5.8	34	8.5
2,000.....	38.97	38.72	13	10.6	13	9.5	77.1	77.0	27	9.3	27	9.2	117.8	115.2	41	11.0	41	.7
2,100.....	41.15	40.79	16	4.5	16	2.8	82.5	81.2	32	10.1	32	3.9	124.3	121.4	49	6.0	48	4.0
2,200.....	43.28	42.94	19	2.0	19	1.4	86.9	85.5	38	5.8	37	10.5	130.9	127.9	57	11.6	56	7.4
2,300.....	45.54	45.17	22	4.0	22	1.8	91.5	90.0	44	10.2	44	1.5	137.7	134.5	67	6.6	65	11.3
2,400.....	47.83	47.45	25	10.7	25	8.2	96.1	94.5	52	0.4	51	1.9	144.8	141.2	78	6.5	76	5.1
2,500.....	50.20	49.78	30	.2	29	9.3	100.8	99.2	60	3.7	59	3.6	151.9	148.2	90	10.0	88	7.2
2,600.....	52.65	52.18	34	4.3	34	0.6	105.6	103.9	68	11.0	67	10.0	159.3	155.2	103	11.6	101	3.8
2,700.....	54.98	54.47	39	2.8	38	10.4	110.4	108.4	78	9.4	77	4.5	166.4	161.9	118	8.5	115	6.7
2,800.....	57.53	56.95	44	8.9	44	3.5	115.6	113.5	89	10.7	88	3.0	174.2	169.4	135	5.7	131	9.5
2,900.....	60.15	59.53	50	10.8	50	4.6	121.6	118.6	102	10.6	100	4.1	182.2	177.6	154	2.4	150	3.2
3,000.....	62.82	62.22	57	8.1	57	2.5	126.3	123.8	116	1.6	113	1.0	189.2	184.7	174	.1	169	9.7

LONGITUDINAL WIND COMPONENTS FOR MODEL OF 1903 RIFLE, 1905 SIGHT, 1906 AMMUNITION (CALCULATED)—Contd.

[$+\Delta X$=yards short at target on horizontal plane; $-\Delta X$=yards over at target on horizontal plane; $+\Delta Y$=distance above at target in vertical plane; $-\Delta Y$=distance below at targe in vertical plane.]

Wind velocities.....	20 miles per hour.				25 miles per hour.				30 miles per hour.			
Direction of wind....	VI.	XII.	VI.	XII.	VI.	XII.	VI.	XII.	VI.	XII.	VI.	XII.
Variation at target...	$+\Delta X$	$-\Delta X$	$+\Delta Y$	$-\Delta Y$	$+\Delta X$	$-\Delta X$	$+\Delta Y$	$-\Delta Y$	$+\Delta X$	$-\Delta X$	$+\Delta Y$	$-\Delta Y$
Range (yards).	*Yards.*	*Yards.*	*Ft. in.*	*Ft. in.*	*Yards.*	*Yards.*	*Ft. in.*	*Ft. in.*	*Yards.*	*Yards.*	*Ft. in.*	*Ft. in.*
100.....	1.9	1.8	0 0.05	0 0.05	2.4	2.3	0 0.064	0 0.063	2.8	2.7	0 0.08	0 0.07
200.....	4.0	3.9	0 .20	0 .20	5.0	4.5	0 .31	0 .27	6.0	5.9	0 .40	0 .36
300.....	6.4	6.3	0 .80	0 .80	8.0	7.8	0 1.03	0 1.00	9.6	9.4	0 1.22	0 1.2
400.....	8.9	8.8	0 1.4	0 1.3	11.2	11.0	0 1.7	0 1.68	13.5	13.3	0 2.10	0 2.0
500.....	12.2	12.0	0 2.8	0 2.7	15.4	15.0	0 3.53	0 3.44	18.4	17.9	0 4.20	0 4.1
600.....	16.0	15.7	0 5.1	0 5.0	20.0	19.6	0 6.39	0 6.23	24.1	23.4	0 7.70	0 7.5
700.....	20.6	19.8	0 8.7	0 8.0	25.8	24.6	0 11.14	0 10.61	31.2	29.5	1 1.4	1 .7
800.....	27.8	26.3	1 3.8	1 3.0	35.2	32.8	1 8.1	1 6.7	42.7	37.8	2 0.4	1 9.6
900.....	40.8	37.2	2 6.2	2 3.6	51.6	46.0	3 2.3	2 10.1	62.7	54.6	3 10.5	3 4.5
1,000.....	54.8	49.8	4 3.4	3 10.8	69.4	61.6	5 5.2	4 9.8	84.3	73.1	6 7.2	5 8.7
1,100.....	69.8	63.2	6 9.0	6 1.4	88.4	78.1	8 6.7	7 5.7	107.5	92.6	10 4.9	8 11.6
1,200.....	82.9	77.2	9 8.7	9 0.6	104.3	95.3	12 2.8	11 2.2	126.1	113.0	14 9.4	13 3.1
1,300.....	92.6	87.8	12 11.0	12 3.0	116.4	109.1	16 3.0	15 2.6	140.7	130.1	19 7.6	18 1.8
1,400.....	102.6	97.2	16 9.6	15 10.0	129.1	120.8	21 1.7	19 9.3	156.0	144.1	25 6.6	23 7.1
1,500.....	113.1	107.0	21 2.7	20 3.9	142.3	133.0	27 .4	25 3.0	172.1	158.5	32 8.3	30 1.3
1,600.....	124.0	117.2	27 .9	25 7.2	156.1	145.6	34 .9	31 9.4	188.4	173.6	41 1.7	37 10.7
1,700.....	133.7	127.8	33 3.4	31 9.7	167.7	158.7	41 9.1	39 6.0	202.0	189.1	50 3.6	47 1.0
1,800.....	141.5	137.3	39 10.9	38 8.8	177.4	170.8	50 .6	48 2.2	213.8	204.0	60 3.6	57 6.5
1,900.....	149.4	145.1	47 5.8	46 1.3	187.5	180.7	59 6.9	57 5.2	225.9	216.1	71 9.2	68 8.0
2,000.....	157.7	153.1	56 2.4	54 6.5	196.6	190.7	70 .6	67 10.8	238.5	228.0	84 11.6	81 2.8
2,100.....	166.4	161.3	66 2.8	64 2.4	208.8	200.9	83 1.2	79 11.6	251.6	240.3	100 1.7	95 7.3
2,200.....	175.3	169.8	77 7.8	75 2.4	220.0	216.3	97 5.0	95 9.0	265.1	252.9	117 4.6	111 11.4
2,300.....	184.4	178.6	90 5.3	87 6.9	231.5	222.4	113 6.5	109 0.8	279.0	265.9	136 9.8	130 4.7
2,400.....	193.8	187.6	104 11.0	101 6.0	243.3	233.5	131 8.4	126 4.9	293.3	279.2	158 9.1	151 1.3
2,500.....	203.5	196.7	121 8.4	117 8.0	256.0	245.0	153 1.2	146 6.1	307.8	292.8	184 1.8	175 1.0
2,600.....	213.4	206.1	139 3.2	134 6.4	268.0	256.6	174 1.1	167 6.0	323.1	306.7	210 10.0	200 2.2
2,700.....	222.9	215.0	159 .4	153 4.9	279.9	267.7	199 8.5	190 11.9	337.5	319.9	240 9.2	228 2.6
2,800.....	233.4	224.9	181 6.0	174 11.2	293.2	280.0	228 0.1	217 9.4	353.5	334.6	274 11.1	260 2.4
2,900.....	244.1	235.1	206 7.4	198 11.4	306.7	292.6	259 7.2	247 7.3	369.9	349.6	312 4.4	295 10.3
3,000.....	255.2	245.4	234 8.4	225 8.4	320.7	305.5	294 10.2	280 1.1	386.9	364.9	357 1.1	335 6.8

PRINCIPAL DIMENSIONS AND WEIGHTS OF UNITED STATES RIFLE, CAL. .30, MODEL OF 1903.

DIMENSIONS.

	Inches.
Barrel.	
Diameter of bore	0.30
Exterior diameter at muzzle	.619
Exterior diameter at breech	1.14
Length of chamber and bore	23.79
Length of travel of bullet in bore	21.697
Diameter of chamber, rear end	.4716
Diameter of chamber, front end	.442
Diameter of neck of chamber, rear end	.3425
Diameter of neck of chamber, front end	.3405
Length of body of chamber	1.793
Length of shoulder of chamber	.16
Length of neck of chamber	.396
Length of chamber, total	2.3716
Rifling:	
Number of grooves, 4.	
Twist, uniform, one turn in	10.00
Width of grooves	.1767
Width of lands	.0589
Depth of grooves	.004
Height of front sight above axis of bore	1.05
Distance from top of front sight to rear side of leaf, leaf raised	22.1254
Stock:	
Length, with butt plate	40.166
Crook, i. e., distance from axis of bore to heel of butt	2.089
Distance from trigger to butt plate	12.74
Length of gun complete	43.212
Sight radius	22.1254
Sight radius (battle sight)	21.5404
Width of single division on windage scale	.0267

WEIGHTS.

	Pounds.
Barrel	2.79
Barrel, with rear-sight base and front-sight stud	3.00
Butt plate	.26
Receiver	.98
Bolt mechanism	1.00
Magazine and trigger guard	.44
Magazine mechanism, including floor plate	.17
Bayonet	1.00
Stock	1.58
Hand guard	.13
Front and rear bands, including swivels	.25
Rear sight, not including base	.20
Total weight of metal parts	7.30
Oiler and thong case	.19
Total weight of arm, including oiler and thong case, with bayonet	9.69
Total weight of arm, including oiler and thong case, without bayonet	8.69
Weight to compress mainspring	16 to 18
Trigger pull (measured at middle point of bow of trigger)	3 to 4½

MISCELLANEOUS DATA.

Initial velocity	2,700 feet per second.
Powder pressure in chamber	about 51,000 pounds per square inch.
Weight of ball cartridge	about 395.5 grains.
Weight of bullet	150 grains.
Weight of powder charge	about 50 grains.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ORDNANCE,
Washington, October 17, 1911.

March 3, 1904.
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Revised February 14, 1908.
Revised April 2, 1909.
Revised October 17, 1911.
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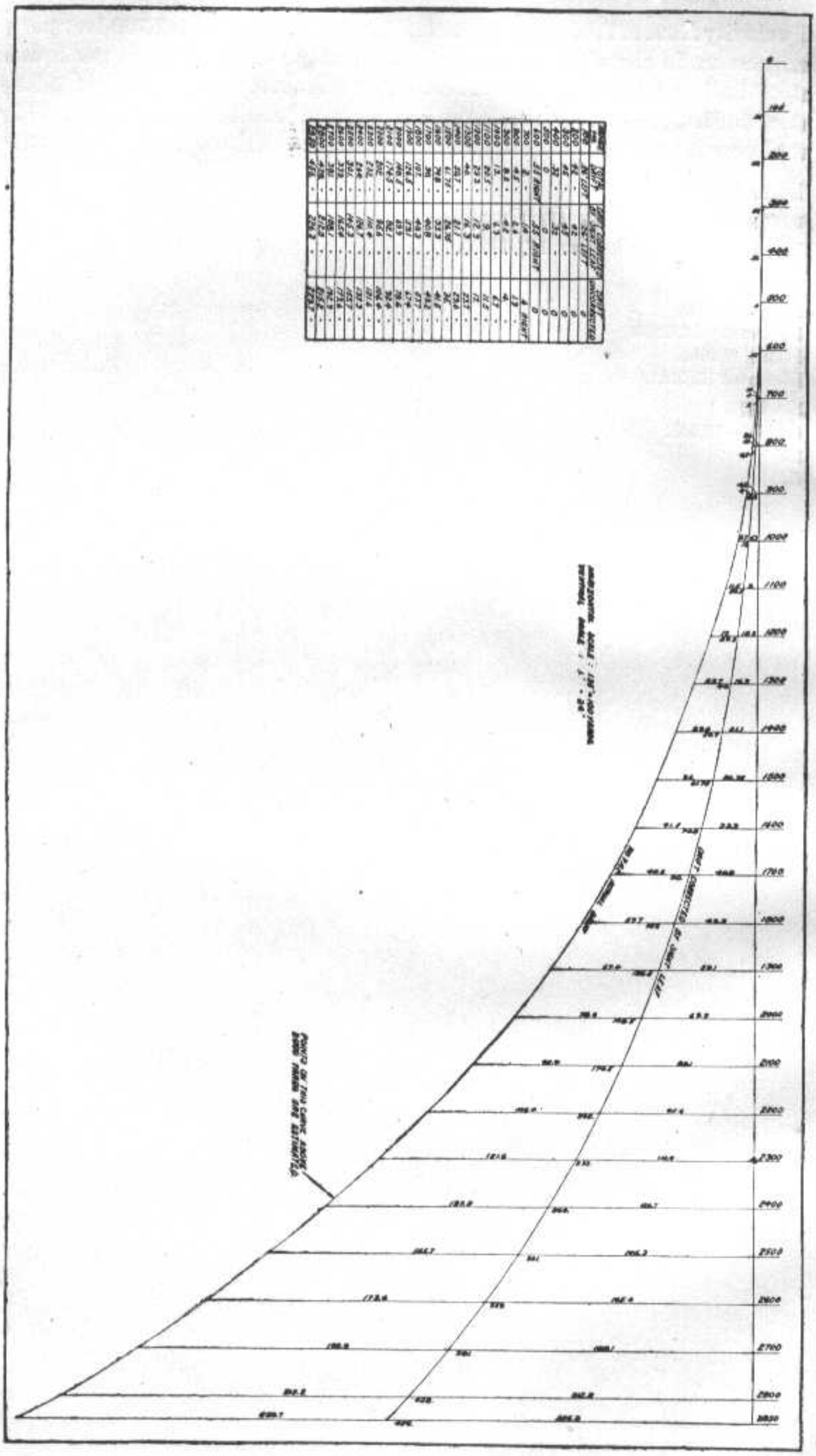
PLATE I.



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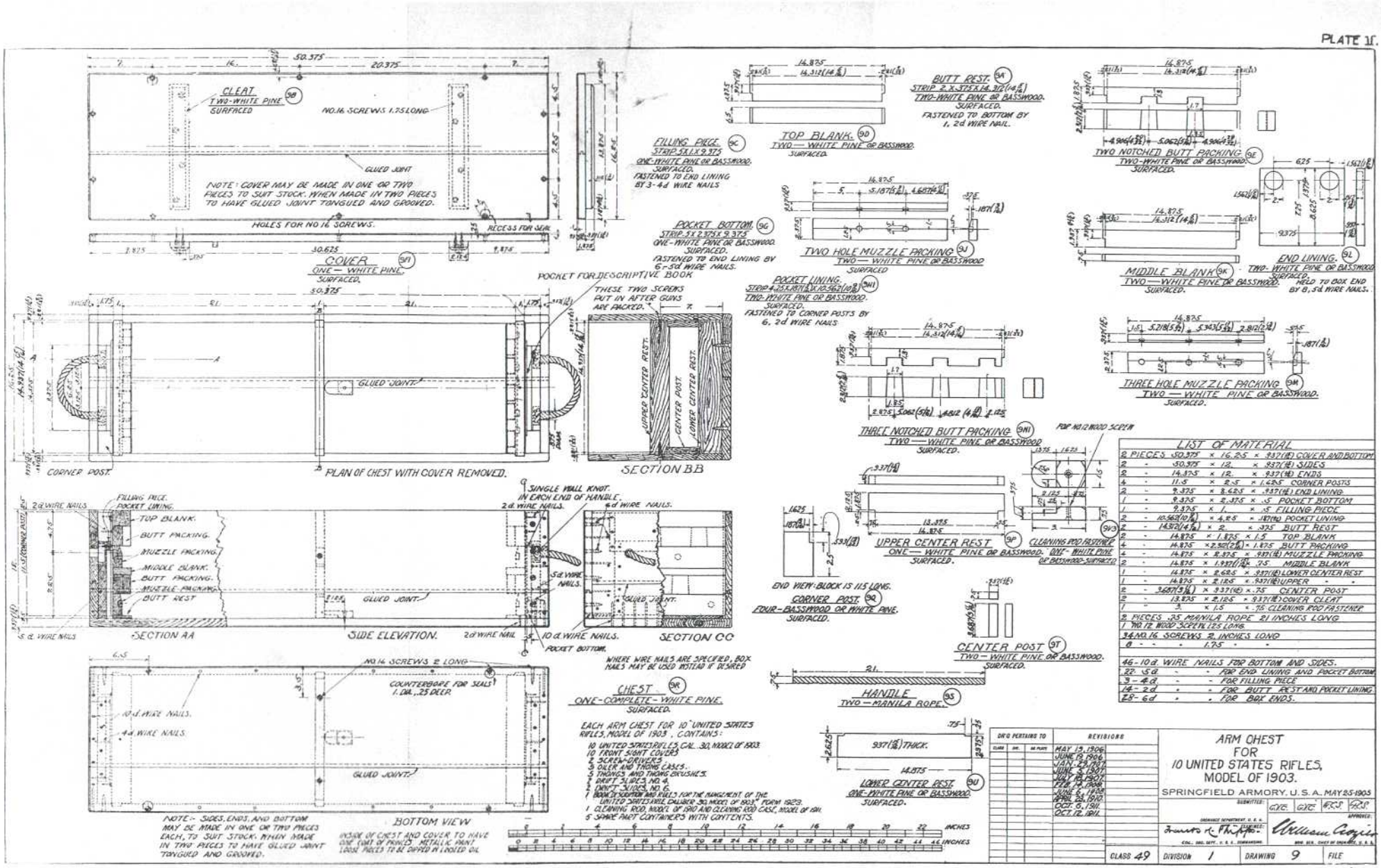

CLEAT
TWO-WHITE PINE
SURFACED
9B
NO.16 SCREWS 1.75 LONG
GLUED JOINT
NOTE: COVER MAY BE MADE IN ONE OR TWO PIECES TO SUIT STOCK. WHEN MADE IN TWO PIECES TO HAVE GLUED JOINT TONGUED AND GROOVED.
HOLES FOR NO 16 SCREWS.
RECESS FOR SEAL
COVER
ONE — WHITE PINE
SURFACED.
9A
BUTT REST.
STRIP 2 X .375 X 14.312 (14 5/16)
TWO-WHITE PINE OR BASSWOOD.
SURFACED.
FASTENED TO BOTTOM BY 1, 2d WIRE NAIL.
FILLING PIECE.
STRIP .5 X 1 X 9.375
ONE-WHITE PINE OR BASSWOOD.
SURFACED.
FASTENED TO END LINING BY 3-4d WIRE NAILS
9C
TOP BLANK.
TWO — WHITE PINE OR BASSWOOD.
SURFACED.
9D
TWO NOTCHED BUTT PACKING
TWO-WHITE PINE OR BASSWOOD
SURFACED.
9E
POCKET BOTTOM.
STRIP .5 X 8.375 X 9.375
ONE-WHITE PINE OR BASSWOOD.
SURFACED.
FASTENED TO END LINING BY 6-5d WIRE NAILS.
9G
TWO HOLE MUZZLE PACKING
TWO — WHITE PINE OR BASSWOOD
SURFACED
9J
END LINING.
TWO-WHITE PINE OR BASSWOOD
SURFACED.
WELD TO BOX END BY 8, 5d WIRE NAILS.
9L
MIDDLE BLANK
TWO — WHITE PINE OR BASSWOOD.
SURFACED.
9K
POCKET LINING.
STRIP 4.25 X .875 (7/8) X 10.562 (10 9/16)
TWO-WHITE PINE OR BASSWOOD.
SURFACED.
FASTENED TO CORNER POSTS BY 6, 2d WIRE NAILS.
9H1
THREE HOLE MUZZLE PACKING
TWO — WHITE PINE OR BASSWOOD
SURFACED.
9M
THREE NOTCHED BUTT PACKING
TWO — WHITE PINE OR BASSWOOD
SURFACED.
9N1
FOR NO.12 WOOD SCREW
UPPER CENTER REST
ONE — WHITE PINE OR BASSWOOD.
SURFACED.
9P
CLEANING ROD FASTENED ONE-WHITE PINE OR BASSWOOD-SURFACED
9W3
END VIEW: BLOCK IS 11.5 LONG.
CORNER POST.
FOUR-BASSWOOD OR WHITE PINE.
SURFACED.
9Q
CENTER POST
TWO — WHITE PINE OR BASSWOOD.
SURFACED.
9T
HANDLE
TWO — MANILA ROPE.
9S
LOWER CENTER REST.
ONE-WHITE PINE OR BASSWOOD.
SURFACED.
9U
CORNER POST.
PLAN OF CHEST WITH COVER REMOVED.
SECTION BB
THESE TWO SCREWS PUT IN AFTER GUNS ARE PACKED.
POCKET FOR DESCRIPTIVE BOOK
UPPER CENTER REST.
CENTER POST.
LOWER CENTER REST.
GLUED JOINT.
SECTION AA
SIDE ELEVATION.
SECTION CC
FILLING PIECE.
POCKET LINING.
TOP BLANK.
BUTT PACKING.
MUZZLE PACKING.
MIDDLE BLANK.
BUTT PACKING.
MUZZLE PACKING.
BUTT REST.
2d WIRE NAILS
5d WIRE NAILS
10d WIRE NAILS.
SINGLE WALL KNOT IN EACH END OF HANDLE.
6d WIRE NAILS.
POCKET BOTTOM.
WHERE WIRE NAILS ARE SPECIFIED, BOX NAILS MAY BE USED INSTEAD IF DESIRED
CHEST
ONE-COMPLETE-WHITE PINE.
SURFACED.
9R
NO.14 SCREWS 2 LONG
COUNTERBORE FOR SEALS 1 DIA. .25 DEEP.
10d WIRE NAILS.
4d WIRE NAILS.
GLUED JOINT.
BOTTOM VIEW
NOTE:- SIDES, ENDS, AND BOTTOM MAY BE MADE IN ONE OR TWO PIECES EACH, TO SUIT STOCK. WHEN MADE IN TWO PIECES TO HAVE GLUED JOINT TONGUED AND GROOVED.
INSIDE OF CHEST AND COVER TO HAVE ONE COAT OF PRIMER. METALLIC PAINT. LOOSE PIECES TO BE DIPPED IN LOADED OIL
EACH ARM CHEST FOR 10 UNITED STATES RIFLES, MODEL OF 1903, CONTAINS:
10 UNITED STATES RIFLES, CAL. .30, MODEL OF 1903
10 FRONT SIGHT COVERS
2 SCREW-DRIVERS
5 OILER AND THONG CASES.
5 THONGS AND THONG BRUSHES.
5 DRIFT SLIDES, NO. 4.
2 UNIT SIGHTS, NO. 5.
1 BOOK DESCRIPTION AND RULES FOR THE MANAGEMENT OF THE UNITED STATES RIFLE, CALIBER .30, MODEL OF 1903, FORM 1923.
1 CLEANING ROD, MODEL OF 1910 AND CLEANING ROD CASE, MODEL OF 1911.
5 SPARE PART CONTAINERS WITH CONTENTS.
INCHES
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 INCHES

LIST OF MATERIAL

2	PIECES	.50.375	× 16.25 × .937(15/16)	COVER AND BOTTOM
2	-	.50.375	× 12. × .937(15/16)	SIDES
2	-	14.375	× 12. × .937(15/16)	ENDS
4	-	11.5	× 2.5 × 1.625	CORNER POSTS
2	-	9.375	× 8.625 × .937(15/16)	END LINING
1	-	9.375	× 2.375 × .5	POCKET BOTTOM
1	-	9.375	× 1. × .5	FILLING PIECE
2	-	10.562(10 9/16)	× 4.25 × .187(3/16)	POCKET LINING
2	-	14.312(14 5/16)	× 2. × .375	BUTT REST
2	-	14.875	× 1.875 × 1.5	TOP BLANK
4	-	14.875	× 2.343(2 3/8) × 1.875	BUTT PACKING
2	-	14.875	× 2.875 × .937(15/16)	MUZZLE PACKING
2	-	14.875	× 1.937(1 15/16) × .5	MIDDLE BLANK
1	-	14.875	× 2.68.5 × .937(15/16)	LOWER CENTER REST
1	-	14.875	× 2.125 × .937(15/16)	UPPER - -
12	-	3.687(3 11/16)	× 9.37(15/16) × .75	CENTER POST
2	-	13.875	× 2.125 × .937(15/16)	COVER CLEAT
1	-	3.	× 1.5 × .75	CLEANING ROD FASTENER
2	PIECES	.25 MANILA ROPE 21 INCHES LONG		
1	NO.12 WOOD SCREW 1.25 LONG.			
34	NO. 16	SCREWS 2 INCHES LONG		
8	- -	1.75	- -	
46	- 10d	WIRE NAILS FOR BOTTOM AND SIDES.		
22	- 5d	- - FOR END LINING AND POCKET BOTTOM		
3	- 4d	- - FOR FILLING PIECE		
14	- 2d	- - FOR BUTT REST AND POCKET LINING		
28	- 6d	- - FOR BOX ENDS.		

D.F.O. PERTAINS TO			REVISIONS
CLASS	SUB.	AM. PLATE	
			MAY 19, 1906.
			JUNE 19, 1906.
			JAN. 23, 1907.
			JUNE 4, 1907.
			JULY 18, 1907.
			FEB. 13, 1908.
			JUNE 6, 1908.
			APRIL 28, 1910.
			OCT. 5, 1911.
			OCT. 12, 1911.

ARM CHEST FOR 10 UNITED STATES RIFLES, MODEL OF 1903.

SPRINGFIELD ARMORY, U. S. A., MAY 25 1905

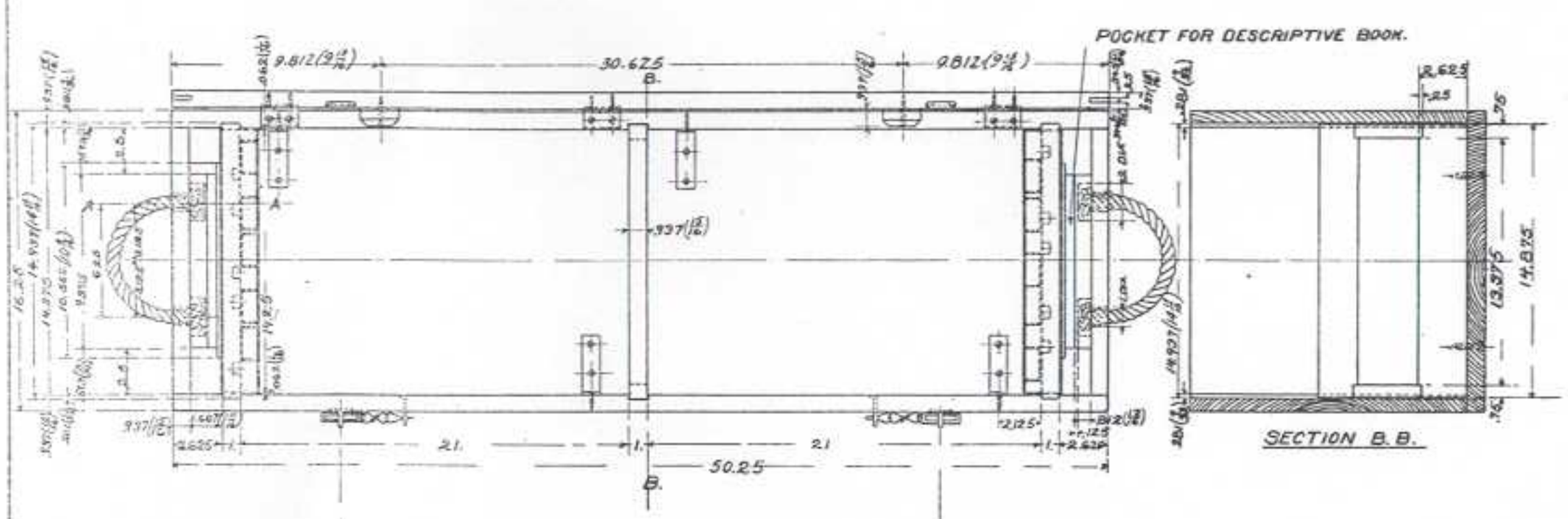
SUBMITTED: GVE. GVE. RSS. RSS.

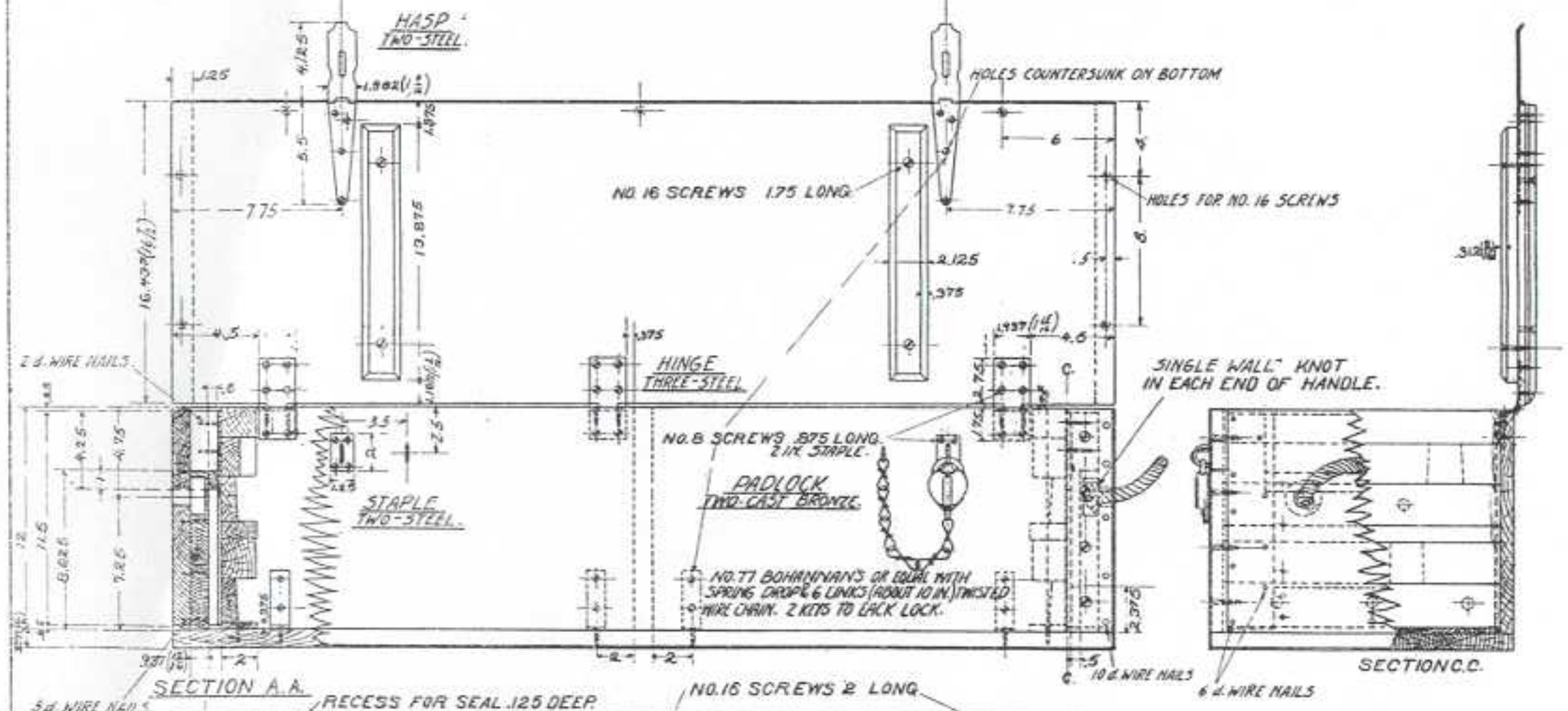
APPROVED: William Crozier

CLASS 49 | DIVISION 1 | DRAWING 9 | FILE

(To face page 70.) No. 1.

PLATE III

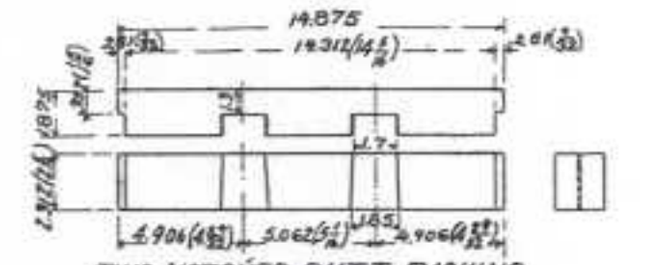




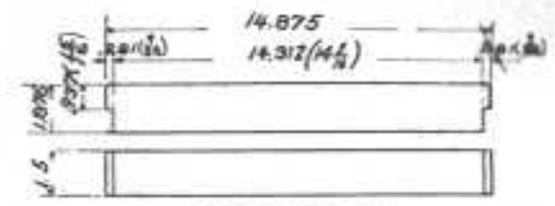
CHEST.
ONE - COMPLETE - WHITE PINE. - SURFACED.
NOTE. CORNER POSTS ARE SPRUCE.
TONGUES IN COVER ARE ASH.

INSIDE OF CHEST EXCEPT COVER TO HAVE ONE COAT OF METALLIC PAINT.
COVER AND OUTSIDE OF CHEST TO HAVE TWO COATS OF OLIVE-DRAB PAINT.
LOOSE PIECES TO BE DIPPED IN LINSEED OIL.

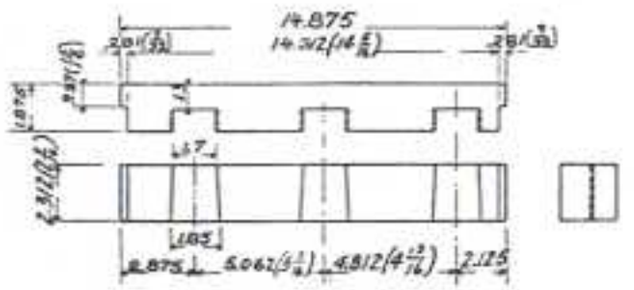
NOTE - SIDES, ENDS, TOP AND BOTTOM MAY BE MADE IN ONE OR TWO PIECES TO SUIT STOCK. WHEN MADE IN TWO PIECES TO HAVE GLUED JOINT TONGUED AND GROOVED.



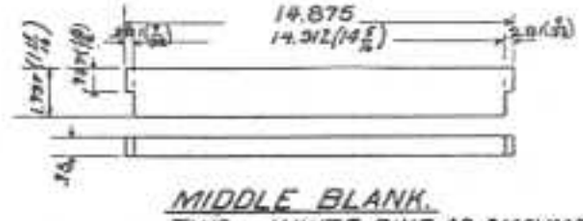
TWO NOTCHED BUTT PACKING.
TWO - WHITE PINE, OR BASSWOOD.
SURFACED.

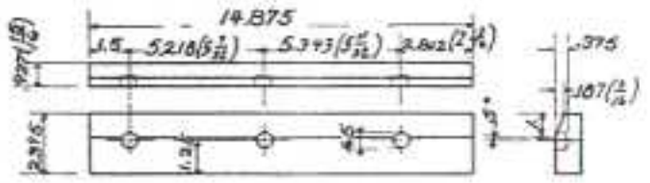


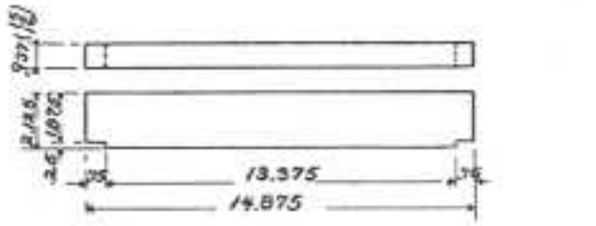
TOP BLANK.
TWO - WHITE PINE, OR BASSWOOD.
SURFACED.



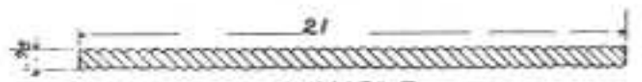
THREE NOTCHED PACKING.
TWO - WHITE PINE, OR BASSWOOD.
SURFACED.

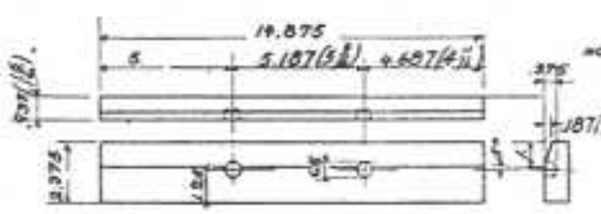


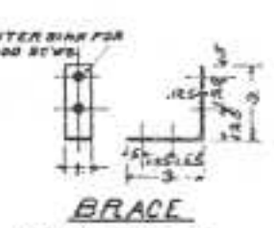
MIDDLE BLANK.
TWO - WHITE PINE, OR BASSWOOD.
SURFACED.

THREE HOLE MUZZLE PACKING.
TWO - WHITE PINE, OR BASSWOOD.
SURFACED.



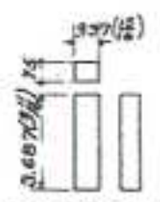
UPPER CENTER REST.
ONE - WHITE PINE, OR BASSWOOD.
SURFACED.



HANDLE.
TWO - MANILA ROPE.

TWO HOLE MUZZLE PACKING.
TWO - WHITE PINE, OR BASSWOOD.
SURFACED.



BRACE.
FOUR - STEEL.



CENTER POST.
TWO - WHITE PINE,
OR BASSWOOD. SURFACED.

DR'G PERTAINS TO			REVISIONS
CLASS	DIV.	AS PLATE	JUNE 1, 1908
			SEPT. 28, 1909
			DEC. 20, 1910.

ARM LOCKER
FOR
U.S. RIFLE.
MODEL OF 1903.
SPRINGFIELD ARMORY, U. S. A., JUNE 13 1906

SUBMITTED: JAG | JG | A.C.A | A.C.A
APPROVED: William Crozier
ENGINEER: Brigadier General, Chief of Ordnance, U.S.A.

CLASS 49 | DIVISION 1 | DRAWING 10 | FILE